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PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

SAC COUNTY

Bridge Deck Overlay

US 20 over North Raccoon River
1.0 mi W of Co Rd M54 (EB/WB)

Refer to the Plan Sheets for list of applicable specifications.

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



Iowa DOT Bridges and Structures
Consultant Coordinator Contact:
Christian Yi

Standard Road Plans

Standard Road Plans are listed on Sheet C.4.

Design Data Rural

Refer to individual
Situation Plans for
Traffic Data information.

Index of Seals		
Sheet No.	Name	Type
A.1	Edward Sowder*	Structural Design
A.3	Xingwei Weng*	Roadway Design

* HTNB

Revisions

	TOTAL
	56
PROJECT IDENTIFICATION NUMBER	
23-81-020-010	
PROJECT NUMBER	
BRF-020-2(156)--38-81	
R.O.W. PROJECT NUMBER	
-	
PROJECT DIRECTORY NUMBER	
8102001023	

Structural Design

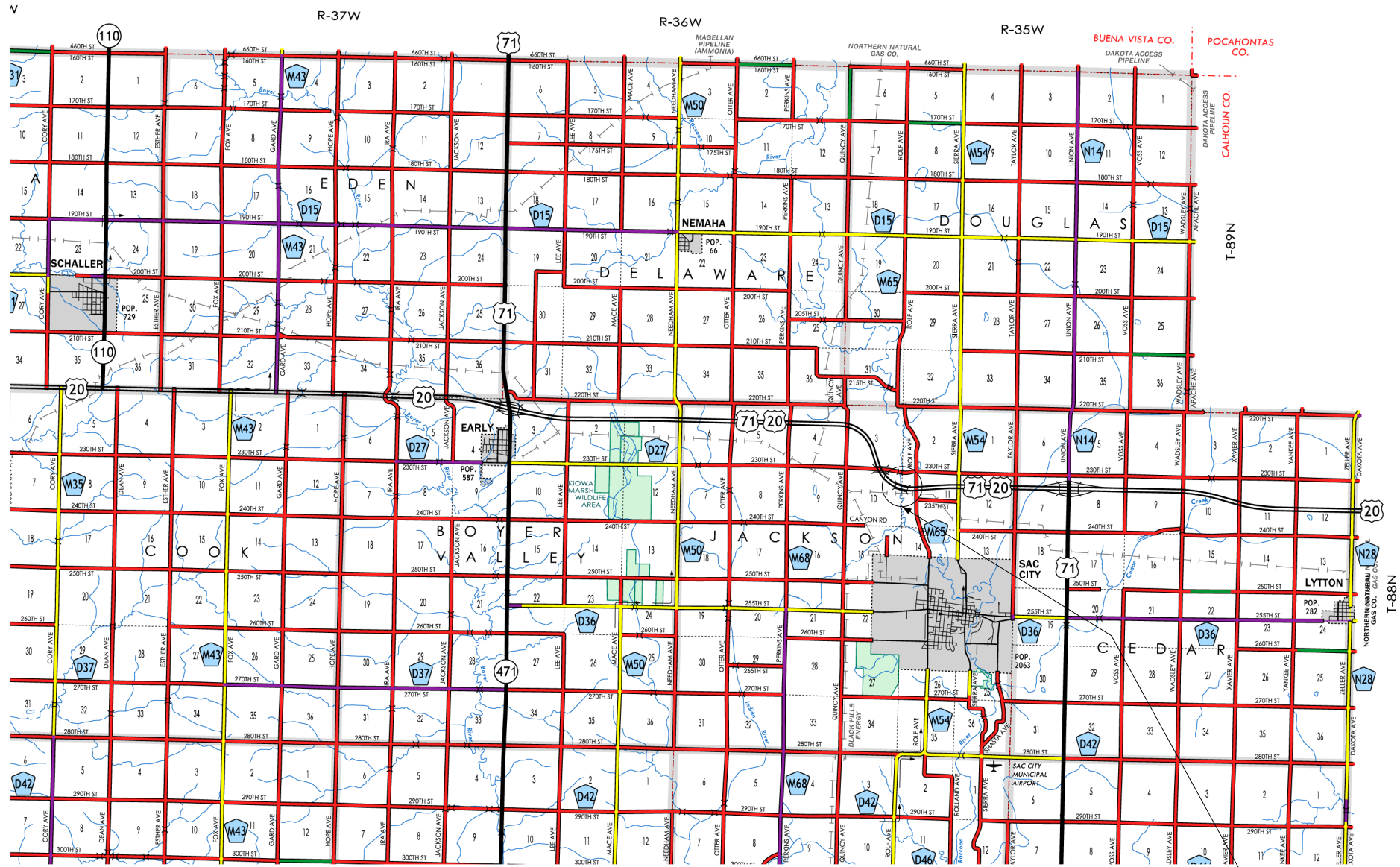


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature Edward M. Sowder 07-24-2026
Date
Printed or Typed Name Edward M. Sowder

My license renewal date is December 31, 2027

Pages or sheets covered by this seal: Sheets A.1, A.2, V.1 thru V.13



Sac 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

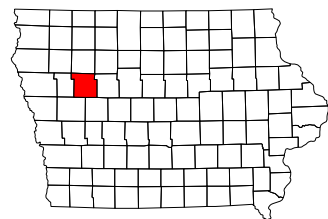
ROAD NAMES

UNINCORPORATED PLACE

STATE PARKS

STATE INSTITUTIONS

FEDERAL LAND



Design Nos. 228 & 128
FHWA Nos. 700085 & 700080

Estimated Bridge Repair Quantities and Reference Notes - Design #228					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 228	Estimate Reference Notes
1	2413-0698074	DECK REPAIR, CLASS A	SY	17.1	--
2	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING	LF	87.0	Includes installation of neoprene gland and water testing of joint.
3	2426-6772016	CONCRETE REPAIR	SF	2.0	--
4	2507-6800061	REVTMENT, CLASS E	TON	50	Estimated at 1.5 ton/cu yd. Class E revetment shall meet requirements of Article 4130.
5	2533-4980005	MOBILIZATION	LS	1	--
		ALTERNATE AA OPTION 1			
6	2413-0698066	DECK OVERLAY (CLASS O PCC)	SY	3,255.9	Includes cleaning existing concrete rails, abutment backwalls, abutment seats and maskwall at NE, and furnishing and placing concrete sealer. See details on Situation Plan.
		ALTERNATE AA OPTION 2			
7	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE)	LS	1	--
8	2413-0698067	DECK OVERLAY (CLASS HPC-O PCC)	SY	3,255.9	Includes cleaning existing concrete rails, abutment backwalls, abutment seats and maskwall at NE, and furnishing and placing concrete sealer. See details on Situation Plan.
9	2413-1000005	FIBER REINFORCEMENT FOR CONCRETE REPAIR/OVERLAY	SY	3,255.9	--

Note:
Roadway quantities shown elsewhere in these plans.

Design For Repairs To Variable Skew, Radius 3,234.90'

Dual 729'-0½" x 40'-0" Prestensioned
Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

Estimated Quantities - WB

STA. 893+14.13 (± U.S. 20)Turn-in Date: Sept 2026

Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 228Design Sheet No. 1 of 7FHWA No. 700085

General Notes:

This design is for repairs to the existing dual 729'-0½" x 40'-0" Pretensioned Prestressed Concrete Beam Bridges on U.S. 20 over North Racoon River. Electronic copies of original design plans are available to the Contractor as part of the E-files supplied with the contract documents. Dimensions shown on these plans are based on design plans (original design No. 410). See Situation Plan for list of repair items.

All dimensions and details shown on these plans pertinent to new construction shall be verified in the field by the Contractor before starting construction.

Faint lines on plans indicate the existing structure.

The 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 ⅝ 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.

The top and interior faces of the existing concrete railing are to be cleaned and sealed in accordance with Article 2403.03, P, of the Standard Specifications. If new sections of rail are constructed, the new sections shall not be sealed. All costs associated with cleaning and sealing of the concrete rails shall be included in the Unit Price Bid Item "Deck Overlay (Class O PCC)" or "Deck Overlay (Class HPC-O PCC)".

In addition to the requirements of Article 2413.03, G, of the Standard Specifications, both exposed Abutment Bridge Seats and Wash Surfaces shall have an application of concrete sealer in accordance with Article 2403.03, P, 3, of the Standard Specifications.

Present deck thickness is about 8". The Contractor shall exercise care in order to prevent unnecessary removal of concrete below the top of the top reinforcing.

The bridge deck may have been epoxy-injected. The Contractor shall remove all exposed epoxy. Removal of epoxy is incidental to "Deck Overlay (Class O PCC)" or "Deck Overlay (Class HPC-O PCC)" and "Deck Repair, Class A" as appropriate.

Plan quantity of deck repair is based on the "survey plot" as shown in these plans. Hatched portions represent Class A bridge repair. Cross hatched portions, if shown, represent Class B bridge deck repair. The plan quantity for "Class A Deck Repair" is estimated as 17.1 SY based on automated sounding of the deck plus 25% increase for estimating purposes. Actual spalled and hollow areas as determined by the Engineer shall be repaired.

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.

Ready mix trucks are not allowed on the prepared portion of the bridge deck.

Surface preparation shall be according to Article 2413.03, B and C of the Standard Specification. The Contractor shall ensure the vertical edges of the stage 1 overlay is prepared for placement of the new concrete for stage 2 by sandblasting or shot blasting, followed by an air blast. Ensure this cleaning removes all dirt, oil, and other foreign material. Ensure it removes all unsound concrete, laitance, or loose material from the surface and edges against which the surface mixture is to be placed. The cleaning should roughen the surface in order to provide satisfactory bond with the surfacing mixture.

Surface raise, as shown on these plans, shall be considered a minimum. In order to limit the additional dead load surface raise shall be restricted to a maximum of ½" more than shown on the plans. Profile may be adjusted to the extent possible within these limits.

Areas of rail repair indicated on the Situation Plan sheet or designated by the Engineer are to be repaired using concrete repair notes and details included in these plans.

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 Specifications 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.

Design History
At This Site
(includes this Design)

Des. No.	Type Of Work
410	Original Design
228	Bridge Deck Overlay

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

Design For Repairs To Variable Skew, Radius 3,234.90'

Dual 729'-0½" x 40'-0" Pretensioned
Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

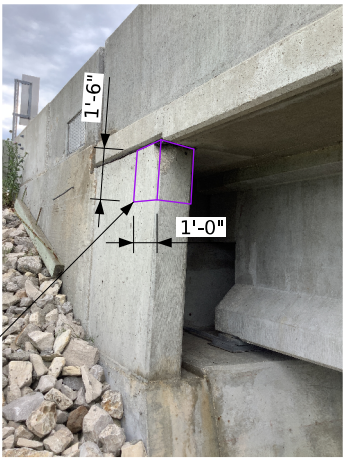
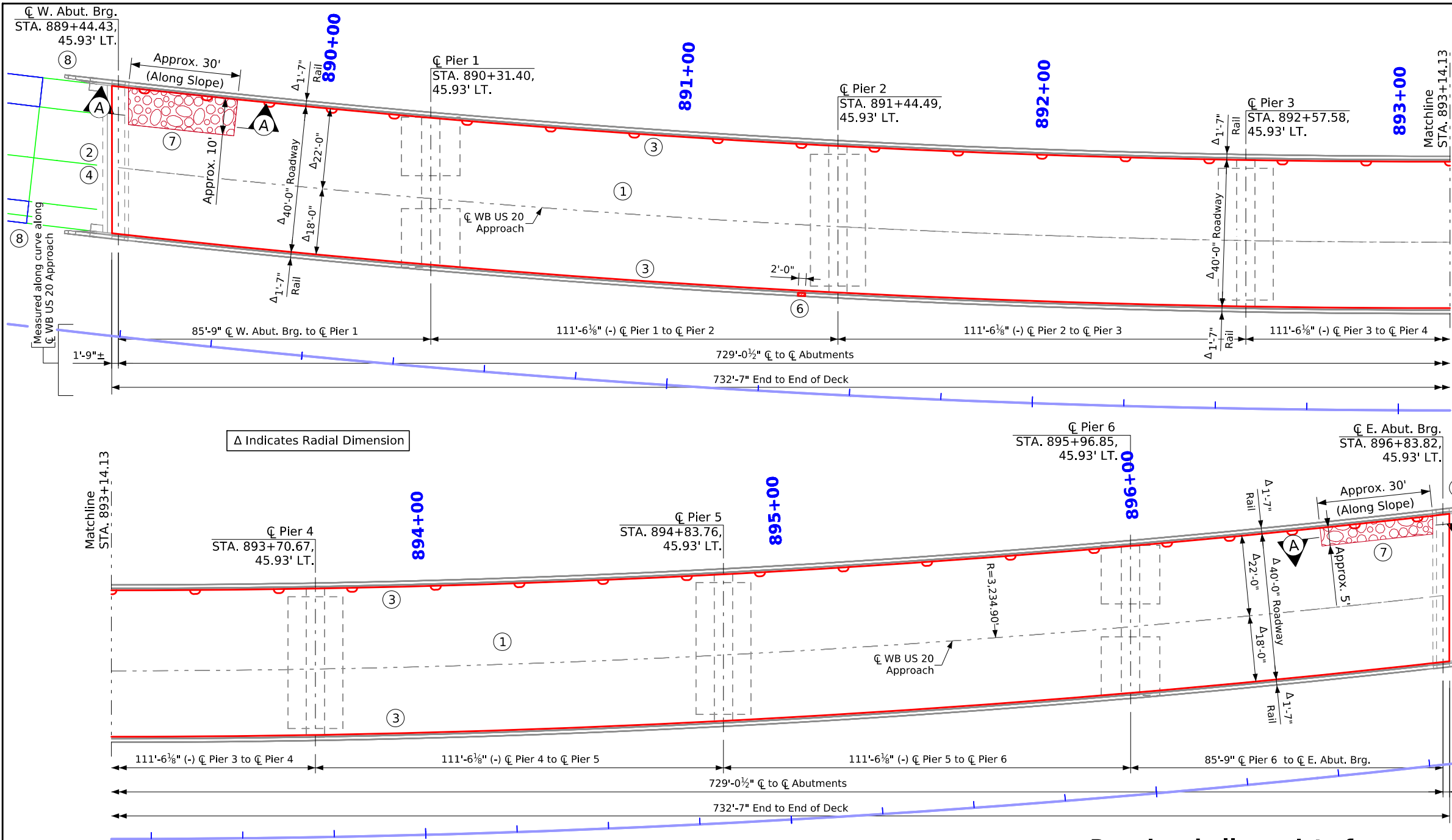
General Notes - WB

STA. 893+14.13 (Ç U.S. 20)Turn-in Date: Sept 2026

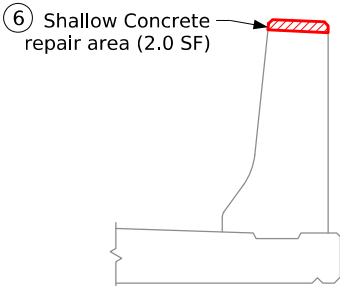
Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 228Design Sheet No. 2 of 7FHWA No. 700085



NE Maskwall Concrete Sealer Details
(Looking East)



Detail of Concrete Repair
(Span 2)

Repair Legend
⑥ Concrete repair spalled rail (2.0 sq. ft.)

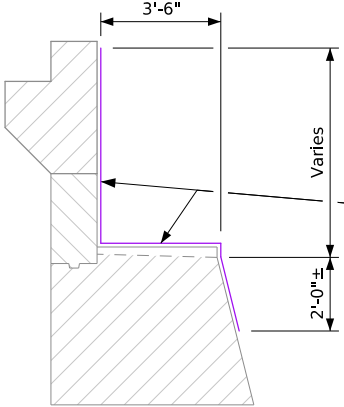
**Traffic Estimate
WB US 20**

2024 AADT	3,250 V.P.D.
TRUCKS	28 %
Total Design ESALS	13,700,000

Location

WB US 20 over North Raccoon River
T-88 N R-36 W
Section 10
Jackson Township
Sac County
FHWA No. 700085
Bridge Maint. No. 8178.9L020
Latitude 42.453534°
Longitude -95.010909°

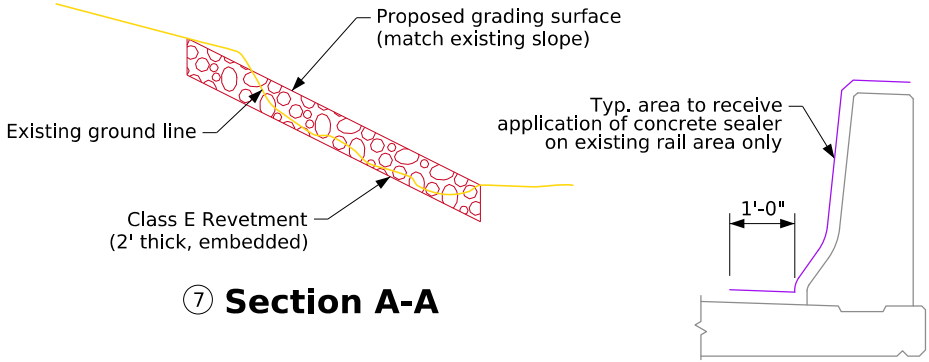
Situation Plan



Abutment Concrete Sealer Detail

Repairs shall consist of:

- ① Scarify deck, complete Class A repairs, and overlay the bridge with PCC.
- ② Replace joint glands and UAC expansion joints.
- ③ Clean and seal inside and top of existing barrier rails and barrier rail end sections.
- ④ Clean and seal abutment backwalls and abutment seats.
- ⑤ Clean and seal spall at NE maskwall.
- ⑥ Concrete repair spalled barrier rail.
- ⑦ Add revetment at NW and NE corners under drain.
- ⑧ Install paved shoulders.
- ⑨ Remove and replace existing guardrails.



Section A-A

Detail of Concrete Sealer Area

Design For Repairs To Variable Skew, Radius 3,234.90'
Dual 729'-0½" x 40'-0" Prestressed Concrete Beam Bridges
85'-9" End Spans 5 - 111'-6" Interior Spans

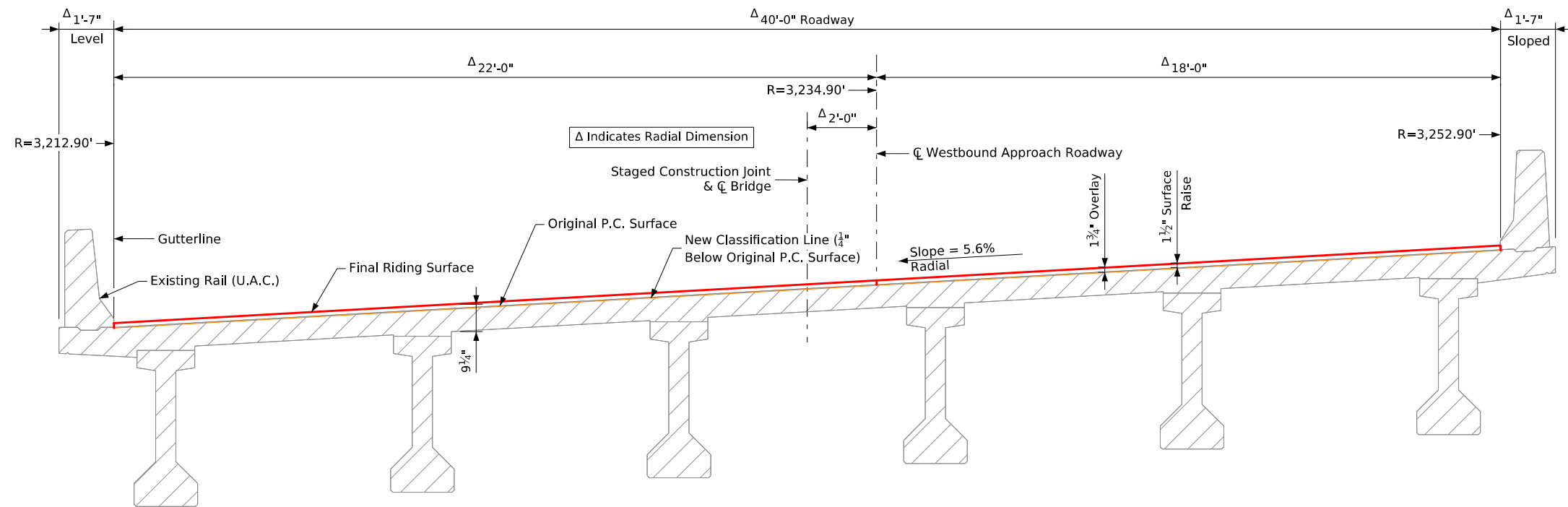
Situation Plan - WB

STA. 893+14.13 (Q U.S. 20) Turn-in Date: Sept 2026

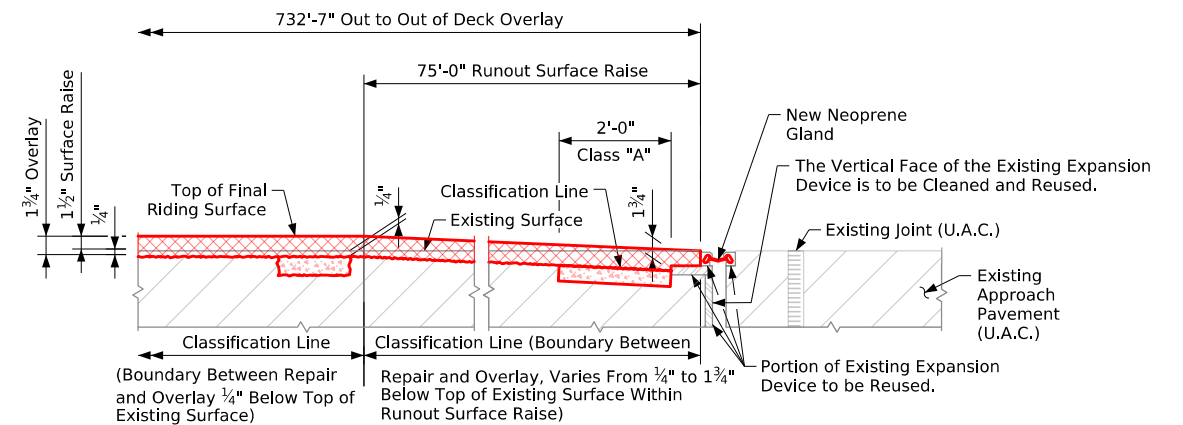
Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 228 Design Sheet No. 3 of 7 FHWA No. 700085



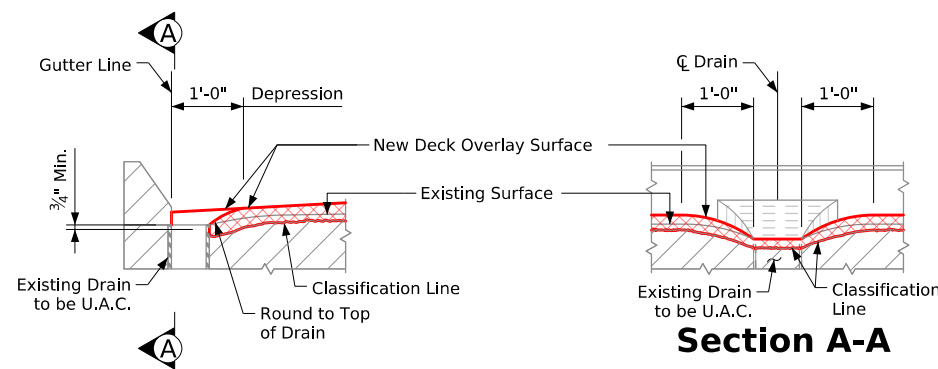
Typical Section
(Looking upstation)



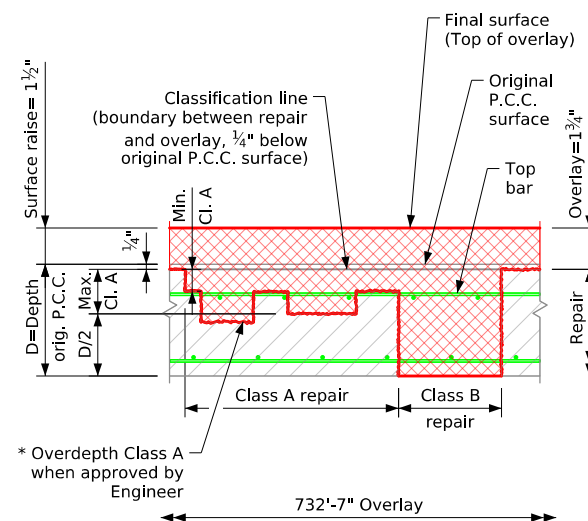
* Per IDOT Std. Spec. 2413.03.C.3.b, limited areas of Class A removal may exceed 50% of the floor thickness at the Engineer's direction. These limited areas of excess depth (overdepth) will be measured as Class A deck repair.

Part Longitudinal Section Along Roadway
Both Abutments

Note: The 2'-0" Class "A" repair area shown at the joint shall be removed to a minimum depth 1" below the existing top mat of reinforcing. The existing bridge deck reinforcing bars shall be carefully exposed and incorporated into the new construction work. A construction joint shall not be located in this 2'-0" area and it shall be poured monolithically with the overlay.



Deck Repair Detail at Drain
(Required at 35 Locations)



* Overdepth Class A when approved by Engineer

Repair and Overlay Definition

Design For Repairs To Variable Skew, Radius 3,234.90'

Dual 729'-0 1/2" x 40'-0" Pretensioned Prestressed Concrete Beam Bridges

85'-9" End Spans 5 - 111'-6" Interior Spans

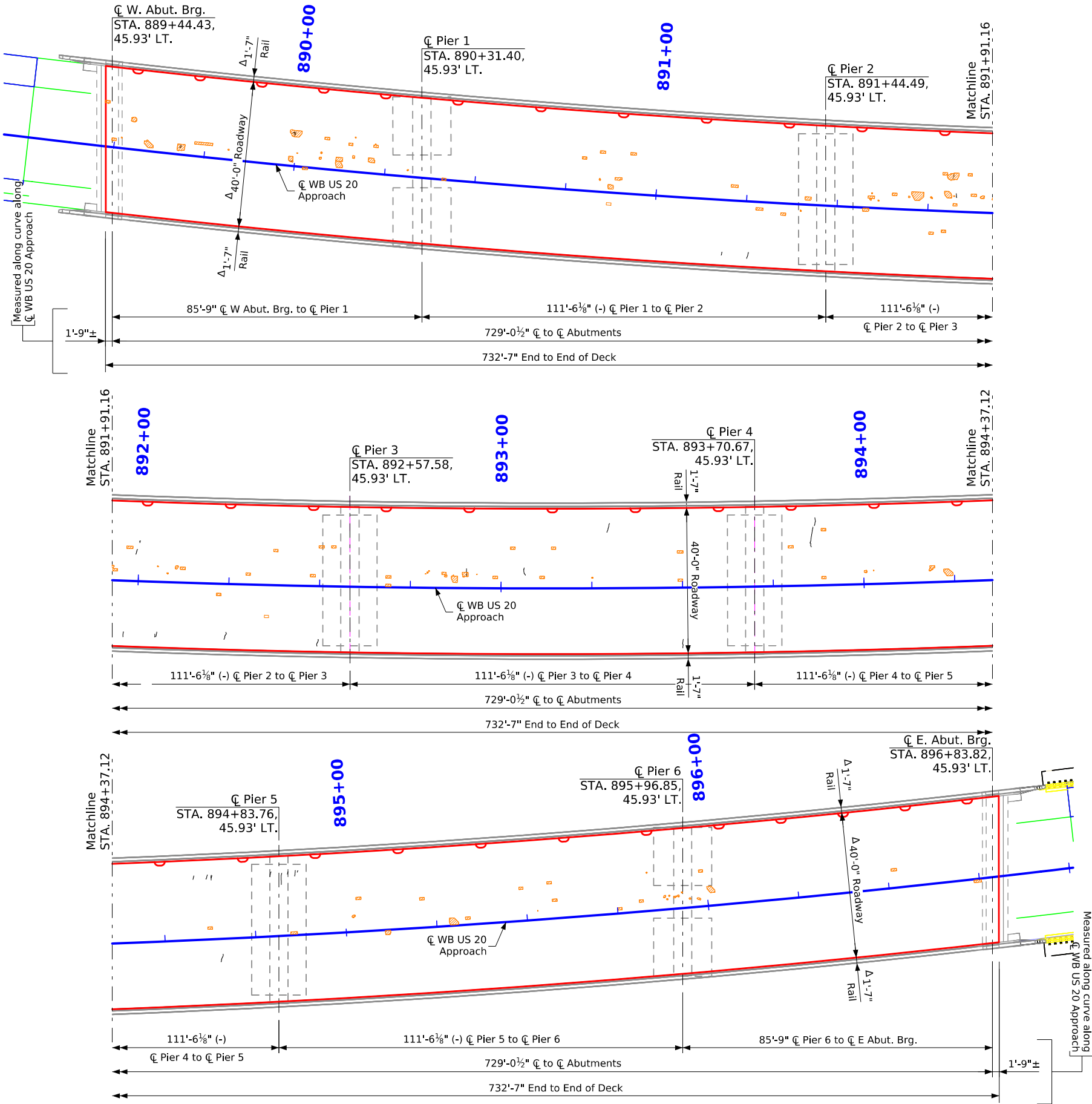
Deck Repair Details - WB

STA. 893+14.13 (C U.S. 20) Turn-in Date: Sept 2026

Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 228 Design Sheet No. 4 of 7 FHWA No. 700085



Estimated Class A Repair

Deck Sounding Area	Sq. Yd.	13.7
Deck Sounding Increase (25%)	Sq. Yd.	3.4
Total Class A (SY)		17.1

Notes:
Data shown was provided by Iowa DOT District personnel.

Limits on Class A repair areas are approximate. Actual areas as designated by the engineer shall be repaired.

Δ Indicates Radial Dimension

Legend

- Class A Repair Area
- Crack

Survey Plot

(Hatched Areas = Areas of Delamination = Approximately 123 Sq. Ft.
(Not to Scale)

Design For Repairs To Variable Skew, Radius 3,234.90'
**Dual 729'-0½" x 40'-0" Pretensioned
Prestressed Concrete Beam Bridges**
85'-9" End Spans 5 - 111'-6" Interior Spans
Deck Sounding Details - WB

STA. 893+14.13 (℄ U.S. 20) Turn-in Date: Sept 2026

Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 228 Design Sheet No. 5 of 7 FHWA No. 700085

Revised 08-13: Steel Extrusion Note was Added to Show a Weld Detail on the Shop Drawings for Splices.
An Additional Neoprene Gland Note About The Corresponding Maximum Deck Temperature was Added.
Issued 11-08: DeckRailBridges.dgn - 1026s-2 -This Sheet Re-Issued 05-2024- Sheet Format Update.

Steel Extrusion Notes:

The existing steel extrusions shall be cleaned and reused. Existing neoprene gland shall be removed and replaced.

Neoprene Gland Notes:

The neoprene gland is to be placed as one continuous piece from end to end of the steel extrusion.

The neoprene gland shall conform to ASTM-2628 modified to exclude recover test and compression set.

The Contractor shall install the gland above the minimum temperature of 45° and the minimum joint opening and corresponding maximum deck temperature shown in these plans. The deck temperature shall be measured by recording the surface temperatures on the underside of the deck adjacent to the joints. If the deck temperature does not fall within the specified temperature range before the Contractor has completed all other required work, it will be necessary for the Contractor to return to the project site to complete installation and testing of the neoprene gland. If the Contractor is required to return to the project site after all other required work has been completed, the Contractor shall complete installation and testing of neoprene gland at no extra charge to the State.

The number of feet of neoprene gland installed shall be paid for at the contract price per foot based on plan quantities. The price for "Neoprene Gland Installation and Testing" shall be full compensation for installing and testing of the new neoprene gland. This work will consist of cleaning the extrusion, installation of the neoprene gland and water tight testing of the expansion joint system. All work and materials necessary for the installation of the neoprene gland shall comply with the recommendations of the Expansion Joint Manufacturer. The price bid for "Neoprene Gland Installation and Testing" shall include all watertight integrity testing, leak repairs as directed by the Engineer, and subsequent watertight testing until a leak free installation is achieved.

Watertight Integrity Testing And Repair Notes:

After installation of each neoprene gland, the Contractor shall perform watertight integrity tests at the deck level to detect any leakage. The tests are to check for leakage at the upturned ends of the expansion device and for leakage along the expansion device across the deck and any medians or sidewalks. The Contractor may conduct a single test of the entire device including upturned ends or may conduct separate tests of upturned ends and one or more tests of overlapping lengths between the upturned ends.

At each upturned end of the expansion device, the Contractor shall block out on the deck at least 3 feet of the expansion device leading to the upturned end and flood the area. A minimum water depth of 3" shall be maintained at the gutter line for at least 30 minutes. During the test, the Inspector shall observe for any overflow at the upturned end. At the conclusion of the test the Inspector will examine the underside of the joint for leakage. The expansion device is considered watertight if the Inspector observes no overflow during the test and if no dripping water or water droplets are visible in the under deck areas near the upturned end.

The Contractor shall test the expansion device between upturned ends by blocking out and covering the device with ponded or flowing water to a depth of at least 1" at all points, for at least 30 minutes. Vertical curb surfaces may be tested with an unnozzled hose delivering approximately one gallon per minute directed to flow over the entire curb height for 30 minutes. At the conclusion of the test, the inspector will examine the underside of the joint for leakage. The expansion device is considered watertight if no dripping water or water droplets are visible in the under deck areas along the full length of the expansion joint. Damp concrete that does not show dripping water or water droplets is not considered a sign of leakage.

If the expansion device leaks at an upturned end or along its length, the Contractor shall locate the leak(s) and take repair measures to stop the leakage. The repair measures shall be as recommended by the Manufacturer and approved by the Engineer prior to beginning corrective work.

If measures to eliminate leakage are taken, the Contractor shall perform subsequent watertight integrity tests subject to the same conditions as the original test.

Table of Approved Expansion Devices

Manufacturer	Type of Steel Extrusion	Neoprene Gland	*Minimum Opening for Gland Installation	*Corresponding Maximum Deck Temperature
Watson-Bowman & Acme Corp.	A	SE-500	1 1⁄16"	90°F
D.S. Brown Co.	SSA2	A2R-XTRA	1 1⁄16"	90°F
Approved Equal				

* Based on existing plans. Contractor shall verify manufacturer of existing steel extrusion before installing neoprene gland.

Design For Repairs To Variable Skew, Radius 3,234.90'

Dual 729'-01½" x 40'-0" Pretensioned Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

Expansion Joint Gland - WB

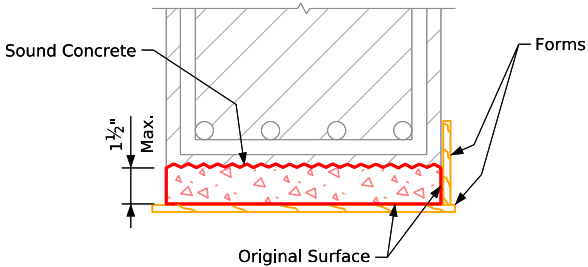
STA. 893+14.13 (Ç U.S. 20)Turn-in Date: Sept 2026

Sac County

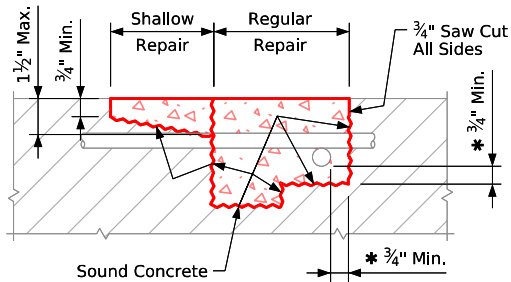
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 228Design Sheet No. 6 of 7FHWA No. 700085

Revised 10-2014 - Deleted All References to Grout. Section 2426 Covers this Requirement and Doesn't Need to be Stated on the Plans.
RepairRetrofitBridges.dgn - 1045 - This Sheet Redrawn 09-27-1990.
RepairRetrofitBridges.dgn - 1045 - This Sheet Re-Issued 07-2023.

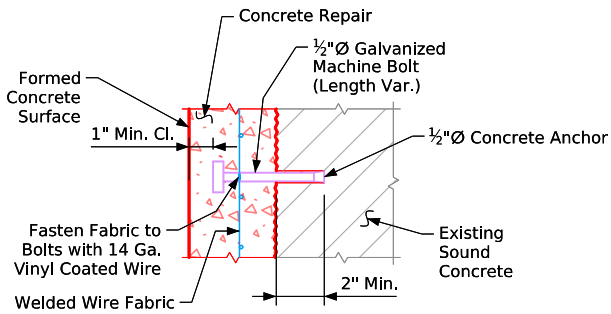


Shallow Repair
Bottom Surface



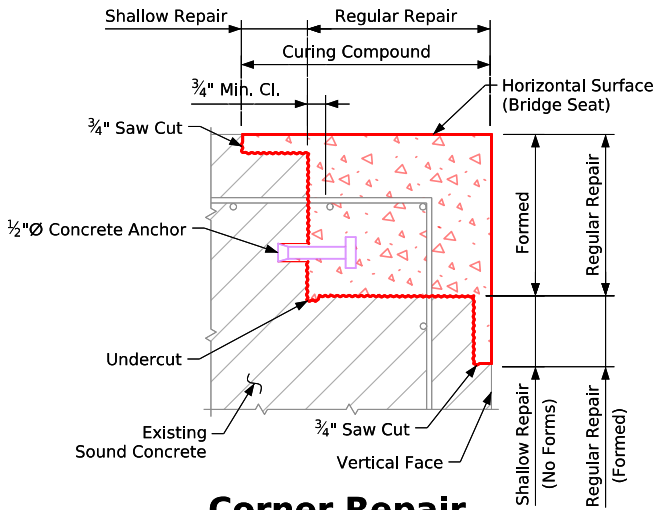
Repair Definition

* Indicates Clearance for an Un-Bonded Rebar.

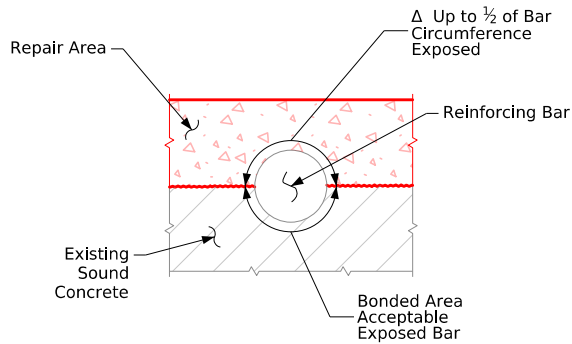


Anchor Detail

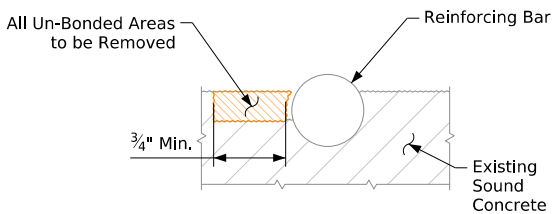
For Spacing and Use of Concrete Anchors
and WWF See the Repair Notes.



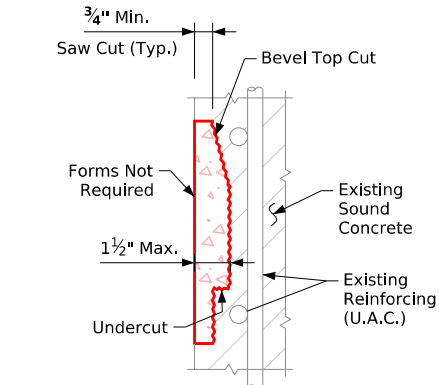
Corner Repair



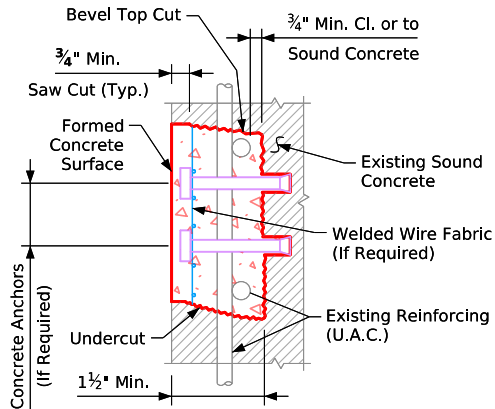
Δ If more than 1/2 of the rebar is exposed it
shall be treated as an un-bonded rebar.



Concrete Removal
Adjacent to Reinforcing



Shallow Repair
Vertical Face



Regular Repair
Vertical Face

Repair Notes:

- The spalled and hollow areas of this bridge as noted and shown in these plans shall be repaired as follows:
- All the costs of equipment and materials required to repair the spalled and hollow areas of this bridge shall be included in the price bid for "Concrete Repair".
 - The price bid for "Concrete Repair" shall include the cost of all concrete anchors and welded wire fabric required by the plans.
 - The Engineer shall determine and outline by visual and audible inspection the actual areas of the concrete repairs. The Contractor shall be paid for the actual amount of repairs made on a square foot basis based on the price bid per square foot.
 - All existing reinforcing bars that are exposed by the concrete removal shall be cleaned and carefully incorporated into the new work, except badly deteriorated existing reinforcing which shall be replaced as directed by the Engineer.
 - The concrete anchors required shall have a minimum pull out of 5,000 lbs based on 4,000 psi concrete. An anchor meeting the requirements of Iowa D.O.T. Materials I.M. 453.09 and the pull out load above is required. The anchors shall be galvanized and shall be installed according to recommendations of the Manufacturer. The cost of furnishing and installing the concrete anchors shall be included in the price bid for "Concrete Repair".
 - The welded wire fabric shall be ASTM A185 and galvanized as per ASTM A-641. The WWF wires shall be spaced 3x3 or 4x4 and the wires shall have a nominal area of 0.014 to 0.029 square inch inclusive, example "WWF 3x3 - W1.4xW2.9".
- Where reinforcement has been exposed and clearance around the periphery of the existing bar is provided, no supplemental reinforcing is required, except where existing reinforcement density and pattern are such that individual open spaces between bars are of 1.5 square feet or larger. For this condition 1/2"Ø concrete anchors and welded wire fabric shall be installed at the rate of one concrete anchor with WWF per each 1.5 square feet of area within each open space.
- Repairing the structural concrete shall be in accordance with Section 2426 of the Standard Specifications.

Concrete Placement Quantities

Mark	Type	Units	Quantity
①	Shallow Repair	Sq. Ft.	2.0
②	Regular Repair	Sq. Ft.	-
		Total (Sq. Ft.)	2.0

Estimated Concrete Repair Quantities

Description	Units	Amount
Concrete Repair	Sq. Ft.	2.0

Design For Repairs To Variable Skew, Radius 3,234.90'
**Dual 729'-0 1/2" x 40'-0" Pretensioned
Prestressed Concrete Beam Bridges**
85'-9" End Spans 5 - 111'-6" Interior Spans
Concrete Repairs - WB
STA. 893+14.13 (© U.S. 20) Turn-in Date: Sept 2026
Sac County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 228 Design Sheet No. 7 of 7 FHWA No. 700085

Estimated Bridge Repair Quantities and Reference Notes - Design #128					
Item No.	Item Code	Item	Unit	Quantities Estimated Design No. 128	Estimate Reference Notes
1	2413-0698074	DECK REPAIR, CLASS A	SY	26.1	--
2	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING	LF	87.0	Includes installation of neoprene gland and water testing of joint.
3	2507-3250005	ENGINEERING FABRIC	SY	60	Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01, B, 3, of the Standard Specifications.
4	2507-6799000	BANK SHAPING	LS	1	--
5	2507-6800061	REVTMENT, CLASS E	TON	77	Estimated at 1.5 ton/cu yd. Class E revetment shall meet requirements of Article 4130.
6	2533-4980005	MOBILIZATION	LS	1	--
		ALTERNATE AA OPTION 1			
7	2413-0698066	DECK OVERLAY (CLASS O PCC)	SY	3,255.9	Includes cleaning existing concrete rails, abutment backwalls, abutment seats, and furnishing and placing concrete sealer. See details on Situation Plan.
		ALTERNATE AA OPTION 2			
8	2403-1000010	TRIAL BATCH AND TEST PLACEMENT (FIBER REINFORCED CONCRETE)	LS	1	--
9	2413-0698067	DECK OVERLAY (CLASS HPC-O PCC)	SY	3,255.9	Includes cleaning existing concrete rails, abutment backwalls, abutment seats, and furnishing and placing concrete sealer. See details on Situation Plan.
10	2413-1000005	FIBER REINFORCEMENT FOR CONCRETE REPAIR/OVERLAY	SY	3,255.9	--

Note:
Roadway quantities shown elsewhere in these plans.

Design For Repairs To Variable Skew, Radius 3,326.76'

Dual 729'-0½" x 40'-0" Pretensioned
Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

Estimated Quantities - EB

STA. 893+14.13 (Ç U.S. 20)Turn-in Date: Sept 2026

Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 128Design Sheet No. 1 of 6FHWA No. 700080

General Notes:

This design is for repairs to the existing dual 729'-0½" x 40'-0" Pretensioned Prestressed Concrete Beam Bridges on U.S. 20 over North Raccoon River. Electronic copies of original design plans are available to the Contractor as part of the E-files supplied with the contract documents. Dimensions shown on these plans are based on design plans (original design No. 410). See Situation Plan for list of repair items.

All dimensions and details shown on these plans pertinent to new construction shall be verified in the field by the Contractor before starting construction.

Faint lines on plans indicate the existing structure.

The 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 ⅝ 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.

The top and interior faces of the existing concrete railing are to be cleaned and sealed in accordance with Article 2403.03, P, of the Standard Specifications. If new sections of rail are constructed, the new sections shall not be sealed. All costs associated with cleaning and sealing of the concrete rails shall be included in the Unit Price Bid Item "Deck Overlay (Class O PCC)" or "Deck Overlay (Class HPC-O PCC)".

In addition to the requirements of Article 2413.03, G, of the Standard Specifications, both exposed Abutment Bridge Seats and Wash Surfaces shall have an application of concrete sealer in accordance with Article 2403.03, P, 3, of the Standard Specifications.

Present deck thickness is about 8". The Contractor shall exercise care in order to prevent unnecessary removal of concrete below the top of the top reinforcing.

The bridge deck may have been epoxy-injected. The Contractor shall remove all exposed epoxy. Removal of epoxy is incidental to "Deck Overlay (Class O PCC)" or "Deck Overlay (Class HPC-O PCC)" and "Deck Repair, Class A" as appropriate.

Plan quantity of deck repair is based on the "survey plot" as shown in these plans. Hatched portions represent Class A bridge repair. Cross hatched portions, if shown, represent Class B bridge deck repair. The plan quantity for "Class A Deck Repair" is estimated as 26.1 SY based on automated sounding of the deck plus 25% increase for estimating purposes. Actual spalled and hollow areas as determined by the Engineer shall be repaired.

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.

Ready mix trucks are not allowed on the prepared portion of the bridge deck.

Surface preparation shall be according to Article 2413.03, B and C of the Standard Specification. The Contractor shall ensure the vertical edges of the stage 1 overlay is prepared for placement of the new concrete for stage 2 by sandblasting or shot blasting, followed by an air blast. Ensure this cleaning removes all dirt, oil, and other foreign material. Ensure it removes all unsound concrete, laitance, or loose material from the surface and edges against which the surface mixture is to be placed. The cleaning should roughen the surface in order to provide satisfactory bond with the surfacing mixture.

Surface raise, as shown on these plans, shall be considered a minimum. In order to limit the additional dead load surface raise shall be restricted to a maximum of ½" more than shown on the plans. Profile may be adjusted to the extent possible within these limits.

Bank Shaping Notes:

The Contractor shall shape, trim and dress the West and East abutments to the proposed grading surface as shown on Detail A on Design Sheet 3 to prepare for placement of engineering fabric and Class E revetment. Approximate areas have been indicated on the situation plan, actual areas will be determined in the field by the Engineer. Areas for revetment shown near the North edge of deck under the drains will not require engineering fabric and shall not be included in "Bank Shaping". All costs for material, equipment, and labor to perform the work noted and directed by the Engineer shall be included in the lump sum unit price bid for "Bank Shaping". No additional measurement or payment shall be made.

Excavation required for Class E revetment is for core out of revetment and calculated from grading surface. See Class 13 Waste quantity in the Roadway Sheets. The disposal of excess soil from shaping or trenching shall be considered incidental to "Bank Shaping".



Berm Erosion at South End of West Abutment
(Looking West)



Berm Erosion at Beam Line B of East Abutment
(Looking East)



Berm Erosion at Beam Line D of East Abutment
(Looking East)

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

Design History At This Site (includes this Design)	
Des. No.	Type Of Work
410	Original Design
128	Bridge Deck Overlay

Design For Repairs To Variable Skew, Radius 3,326.76'

Dual 729'-0½" x 40'-0" Pretensioned Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

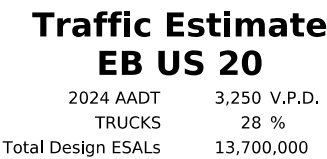
General Notes - EB

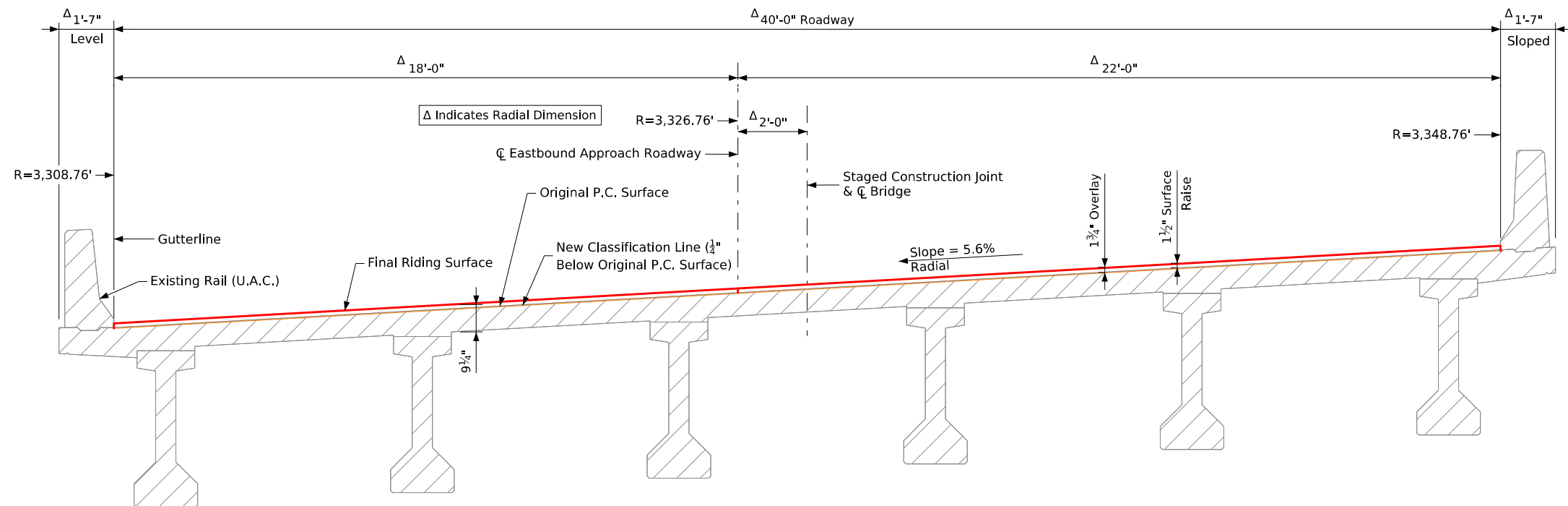
STA. 893+14.13 (© U.S. 20)Turn-in Date: Sept 2026

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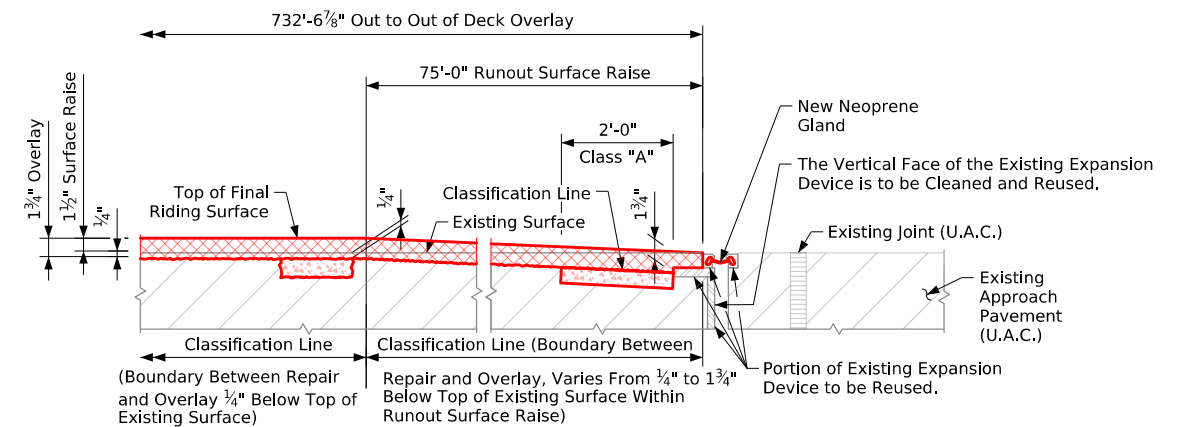
Design No. 128Design Sheet No. 2 of 6FHWA No. 700080





Typical Section
(Looking upstation)

* Per IDOT Std. Spec. 2413.03.C.3.b, limited areas of Class A removal may exceed 50% of the floor thickness at the Engineer's direction. These limited areas of excess depth (overdepth) will be measured as Class A deck repair.



Part Longitudinal Section Along Roadway
Both Abutments

Note: The 2'-0" Class "A" repair area shown at the joint shall be removed to a minimum depth 1" below the existing top mat of reinforcing. The existing bridge deck reinforcing bars shall be carefully exposed and incorporated into the new construction work. A construction joint shall not be located in this 2'-0" area and it shall be poured monolithically with the overlay.

Design For Repairs to Variable Skew, Radius 3,326.76'

Dual 729'-0 1/2" x 40'-0" Prestressed Concrete Beam Bridges

85'-9" End Spans 5 - 111'-6" Interior Spans

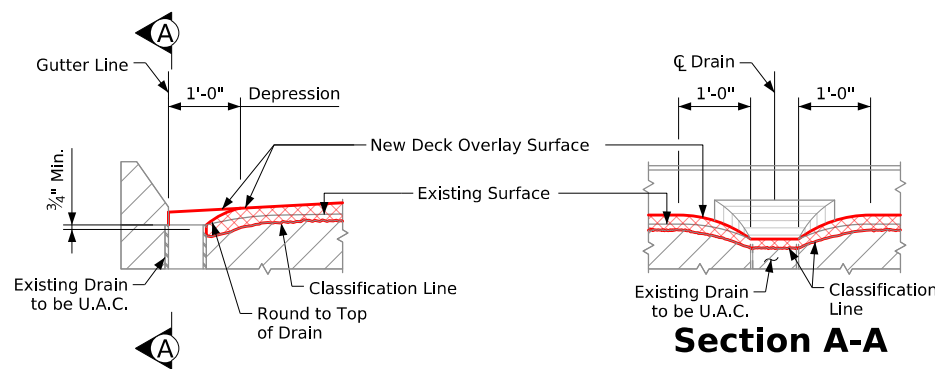
Deck Repair Details - EB

STA. 893+14.13 (C U.S. 20) Turn-in Date: Sept 2026

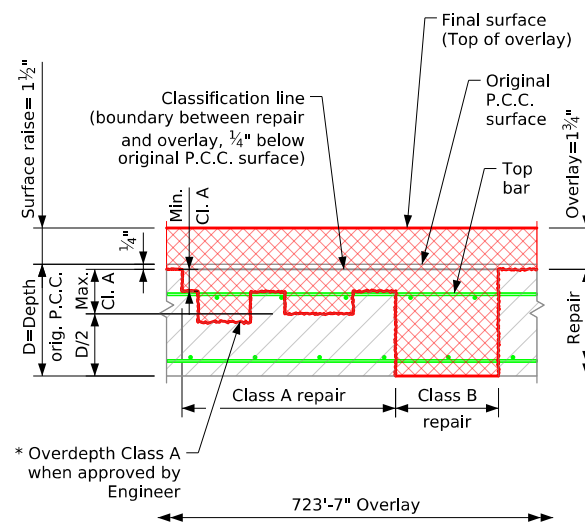
Sac County

IOWA DEPARTMENT OF TRANSPORTATION

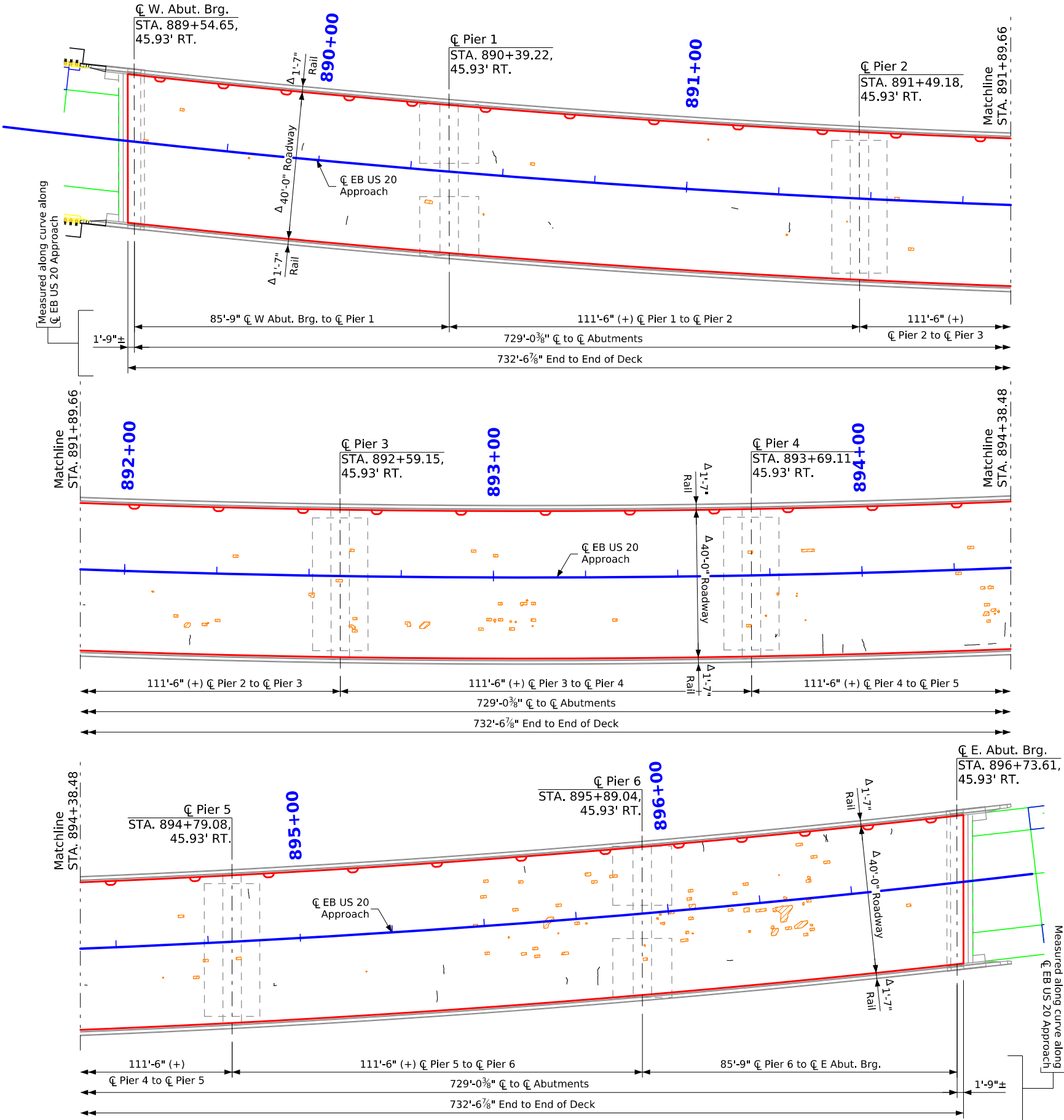
Design No. 128 Design Sheet No. 4 of 6 FHWA No. 700080



Deck Repair Detail at Drain
(Required at 35 Locations)



Repair and Overlay Definition



Survey Plot
(Hatched = Areas of Delamination = Approximately 188 Sq. Ft.)
(Not to Scale)

Estimated Class A Repair		
Deck Sounding Area	Sq. Yd.	20.9
Deck Sounding Increase (25%)	Sq. Yd.	5.2
Total Class A (SY)		26.1

Notes:
Data shown was provided by Iowa DOT District personnel.

Limits on Class A repair areas are approximate. Actual areas as designated by the engineer shall be repaired.



Legend	
	Class A Repair Area
	Crack

Design For Repairs To Variable Skew, Radius 3,326.76'

Dual 729'-0½" x 40'-0" Pretensioned
Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

Deck Sounding Details - EB

STA. 893+14.13 (℄ U.S. 20)Turn-in Date: Sept 2026

Sac County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 128Design Sheet No. 5 of 6FHWA No. 700080

Revised 08-13: Steel Extrusion Note was Added to Show a Weld Detail on the Shop Drawings for Splices.
An Additional Neoprene Gland Note About The Corresponding Maximum Deck Temperature was Added.
Issued 11-08:
DeckRailBridges.dgn - 1026s-2 -This Sheet Re-Issued 05-2024- Sheet Format Update.

Steel Extrusion Notes:

The existing steel extrusions shall be cleaned and reused. Existing neoprene gland shall be removed and replaced.

Neoprene Gland Notes:

The neoprene gland is to be placed as one continuous piece from end to end of the steel extrusion.

The neoprene gland shall conform to ASTM-2628 modified to exclude recover test and compression set.

The Contractor shall install the gland above the minimum temperature of 45° and the minimum joint opening and corresponding maximum deck temperature shown in these plans. The deck temperature shall be measured by recording the surface temperatures on the underside of the deck adjacent to the joints. If the deck temperature does not fall within the specified temperature range before the Contractor has completed all other required work, it will be necessary for the Contractor to return to the project site to complete installation and testing of the neoprene gland. If the Contractor is required to return to the project site after all other required work has been completed, the Contractor shall complete installation and testing of neoprene gland at no extra charge to the State.

The number of feet of neoprene gland installed shall be paid for at the contract price per foot based on plan quantities. The price for "Neoprene Gland Installation and Testing" shall be full compensation for installing and testing of the new neoprene gland. This work will consist of cleaning the extrusion, installation of the neoprene gland and water tight testing of the expansion joint system. All work and materials necessary for the installation of the neoprene gland shall comply with the recommendations of the Expansion Joint Manufacturer. The price bid for "Neoprene Gland Installation and Testing" shall include all watertight integrity testing, leak repairs as directed by the Engineer, and subsequent watertight testing until a leak free installation is achieved.

Watertight Integrity Testing And Repair Notes:

After installation of each neoprene gland, the Contractor shall perform watertight integrity tests at the deck level to detect any leakage. The tests are to check for leakage at the upturned ends of the expansion device and for leakage along the expansion device across the deck and any medians or sidewalks. The Contractor may conduct a single test of the entire device including upturned ends or may conduct separate tests of upturned ends and one or more tests of overlapping lengths between the upturned ends.

At each upturned end of the expansion device, the Contractor shall block out on the deck at least 3 feet of the expansion device leading to the upturned end and flood the area. A minimum water depth of 3" shall be maintained at the gutter line for at least 30 minutes. During the test, the Inspector shall observe for any overflow at the upturned end. At the conclusion of the test the Inspector will examine the underside of the joint for leakage. The expansion device is considered watertight if the Inspector observes no overflow during the test and if no dripping water or water droplets are visible in the under deck areas near the upturned end.

The Contractor shall test the expansion device between upturned ends by blocking out and covering the device with ponded or flowing water to a depth of at least 1" at all points, for at least 30 minutes. Vertical curb surfaces may be tested with an unnozzled hose delivering approximately one gallon per minute directed to flow over the entire curb height for 30 minutes. At the conclusion of the test, the inspector will examine the underside of the joint for leakage. The expansion device is considered watertight if no dripping water or water droplets are visible in the under deck areas along the full length of the expansion joint. Damp concrete that does not show dripping water or water droplets is not considered a sign of leakage.

If the expansion device leaks at an upturned end or along its length, the Contractor shall locate the leak(s) and take repair measures to stop the leakage. The repair measures shall be as recommended by the Manufacturer and approved by the Engineer prior to beginning corrective work.

If measures to eliminate leakage are taken, the Contractor shall perform subsequent watertight integrity tests subject to the same conditions as the original test.

Table of Approved Expansion Devices

Manufacturer	Type of Steel Extrusion	Neoprene Gland	*Minimum Opening for Gland Installation	*Corresponding Maximum Deck Temperature
Watson-Bowman & Acme Corp.	A	SE-500	1 7⁄16"	90°F
D.S. Brown Co.	SSA2	A2R-XTRA	1 7⁄16"	90°F
Approved Equal				

* Based on existing plans. Contractor shall verify manufacturer of existing steel extrusion before installing neoprene gland.

Design For Repairs To Variable Skew, Radius 3,326.76'

Dual 729'-01½" x 40'-0" Pretensioned Prestressed Concrete Beam Bridges

85'-9" End Spans5 - 111'-6" Interior Spans

Expansion Joint Gland - EB

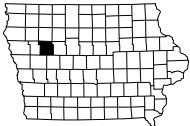
STA. 893+14.13 (Ç U.S. 20)Turn-in Date: Sept 2026

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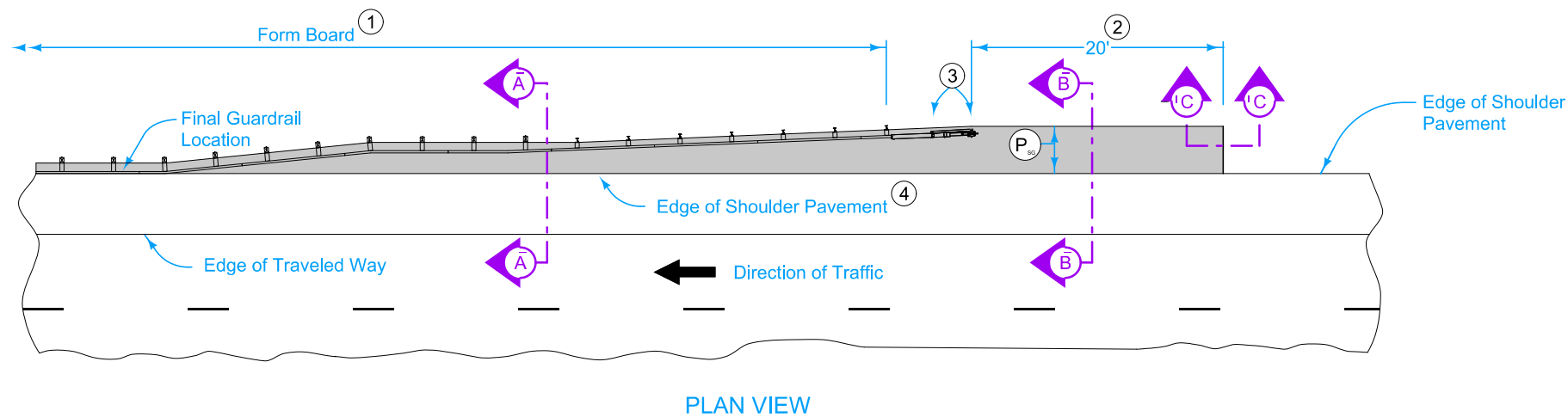
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 128Design Sheet No. 6 of 6FHWA No. 700080

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
* A.3	Title Sheet
B Sheets	Typical Cross Sections and Details
* B.1 - B.3	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1 - C.2	Estimated Project Quantities & Reference Notes
C.3 - C.21	Tabulations
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - D.3	US 20 Plan Sheets
J Sheets	Traffic Control and Staging Sheets
J.1 - J.4	Traffic Control Plan, Staging Notes and Tabulations
* J.5	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.6	Staging Typical Sections
* J.7 - J.10	Staging and Traffic Control Sheets
U Sheets	Modified Standards and Details
* U.1	Curb Construction Details
* U.2 - U.3	Guardrail Details
	* Color Plan Sheets



ROADWAY 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 <u>07-24-2026</u>
	<u>Xingwei Weng</u> Printed or Typed Name
	My license renewal date is December 31, 2027
Pages or sheets covered by this seal: <u>A.3, B.1 - B.3, C.1 - C.21, D.1 - D.3, J.1 - J.10, U.1 - U.3</u>	

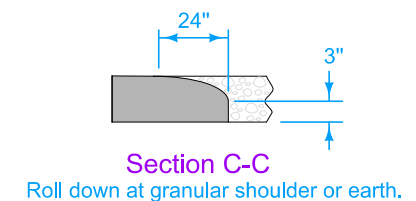
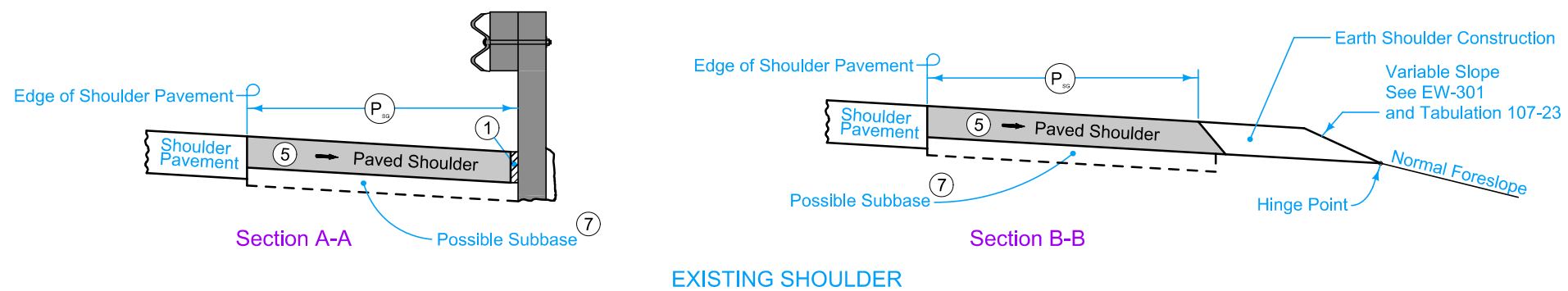
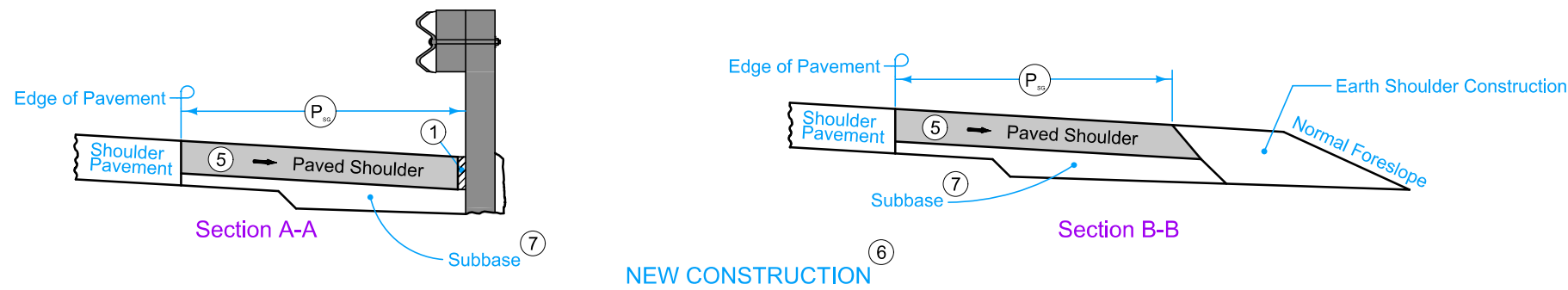


8" PCC Paved Shoulder at guardrail with the following jointing layout:

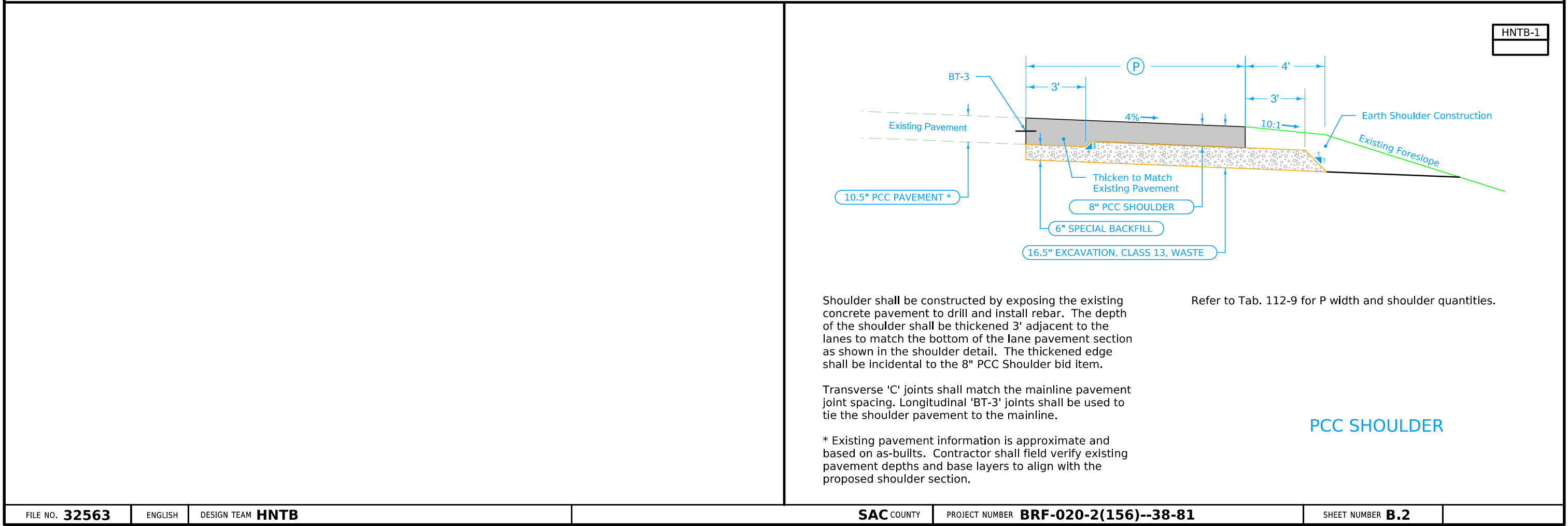
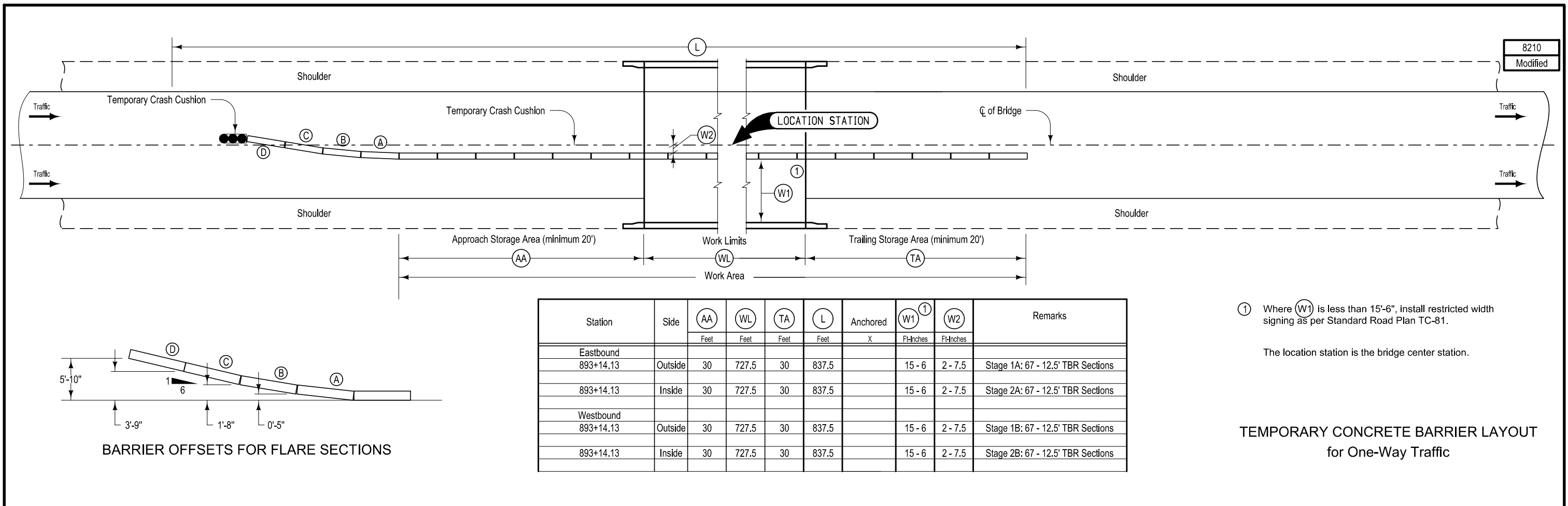
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

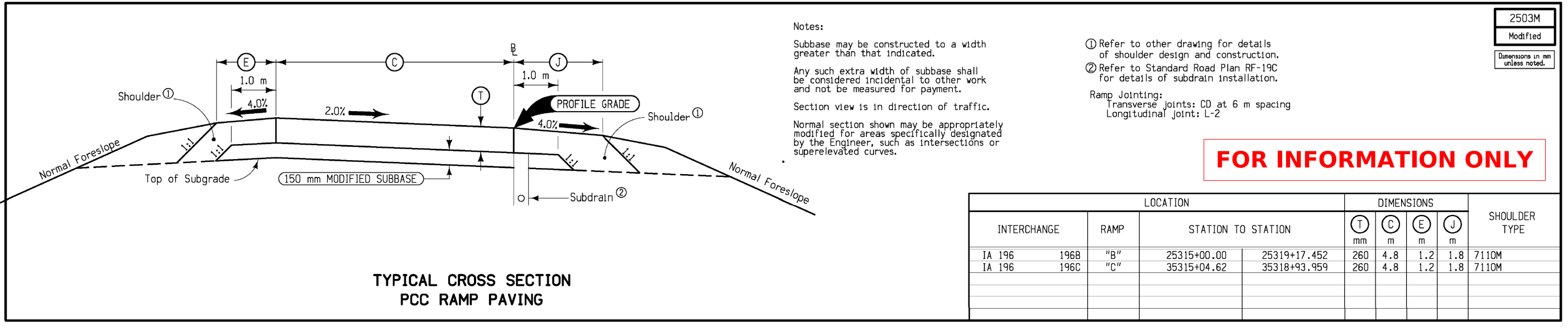
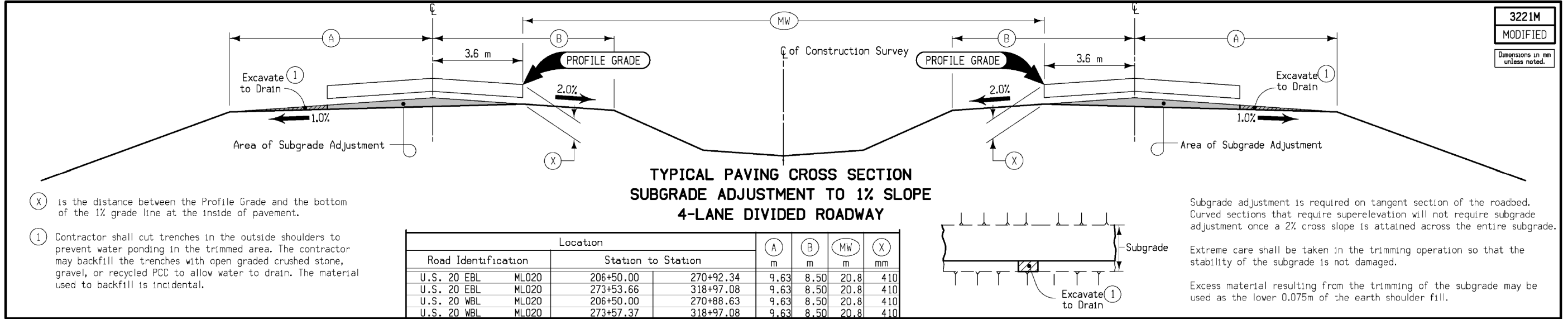
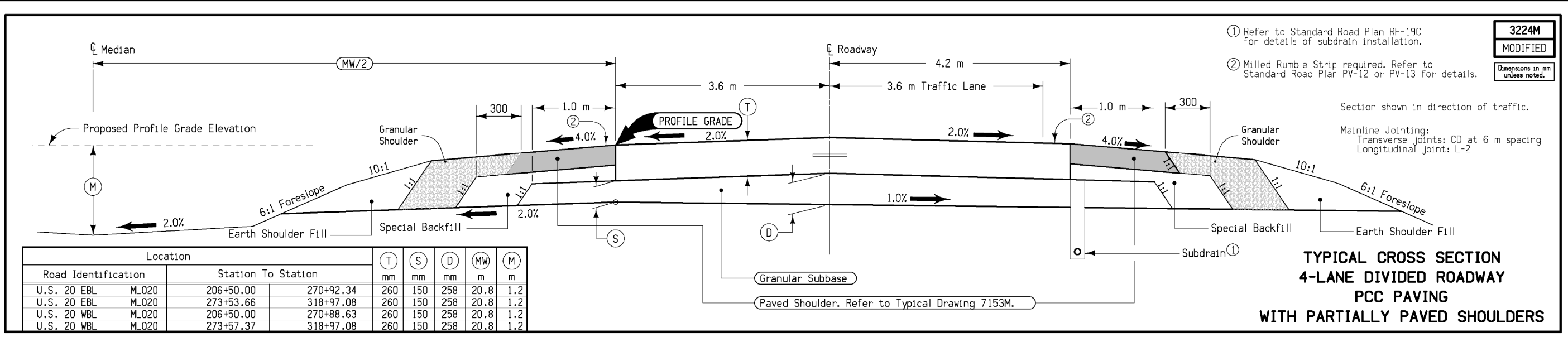
Refer to Tabulation 112-9 for shoulder quantities.

- ① When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'BT' joint (per PV-101) for PCC shoulder.
- ⑤ Match shoulder slope.
- ⑥ The Contractor has the option to pave the paved shoulder at guardrail and the full width paved shoulder as one operation.
- ⑦ Refer to other details in the plan.



PAVED SHOULDER AT GUARDRAIL
(ADJACENT TO FULL WIDTH PAVED SHOULDER)





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	1,663.1	Refer to Tab. 112_09 for locations and details. Existing PCC from Pavement removal may be used on the project as special backfill.
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	218.4	Refer to Tab. 107_23 and Standard Road Plan EW-301. Provide borrow material according to Section 2102 of the Standard Specifications. Material shall be provided by the Contractor.
3	2102-2713090	EXCAVATION, CLASS 13, WASTE	CY	1,576.7	Refer to Tab. 112_09 for locations and details. This item is for the removal of existing granular shoulder and existing pavement base material. Dispose of excess material according to Article 1106.07 of the current specifications. No payment for overhaul allowed.
4	2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY	90	Refer to Tab. 103_10. This item is for stripping and salvaging 8 inches of topsoil from grading for guardrail installations. Topsoil shall be spread to an 8 inch thickness, after shrinkage, over disturbed areas to finished grade. No cross sections are provided with the contract documents.
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	47.7	
6	2122-5190008	PAVED SHOULDER, P.C. CONCRETE, 8 IN.	SY	3,033.8	Refer to Tab. 112_09 and B Sheets for locations and details. This item is for the paved shoulder at guardrail and the paved PCC shoulder for shifting traffic during construction. The existing outside lanes are 14' wide and existing inside lanes are 12' wide. The outside PCC shoulder shall widen 8' from the existing 14' panel. The inside shoulders shall be full 6' wide reconstruction.
7	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	36.45	Refer to Tab. 112_09 for locations and details.
8	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE, BRIDGE DECK	SY	6,015.2	Refer to Tab. 100_28 for details.
9	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	800	Refer to Tab. 110_07A for details.
10	2505-4008300	STEEL BEAM GUARDRAIL	LF	462.5	Refer to Tab. 108_08A for details.
11	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	4	
12	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4	
13	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	4	
14	2510-6745850	REMOVAL OF PAVEMENT	SY	2,318.7	Refer to Tabs. 102_05 and 110_01 for locations and quantities. This item includes the removal of shoulder pavement for shoulder strengthening and curb installation.
15	2512-1750006	CURB AND GUTTER, P.C. CONCRETE, AS PER PLAN	LF	50	Refer to Tab. 112_04 for locations and quantities. Refer to U Sheets for details.
16	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY	LS	1	Survey required to be furnished for the construction of the project includes, but is not limited to, guardrail, bridge approaches, and grading for guardrail as needed.
17	2527-9263137	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT-BASED	EACH	16	Refer to Tab. 108_29 for locations and details.

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadway Items	
18	2527-9263181	PAVEMENT MARKINGS REMOVED	STA	70.72	Refer to Tab. 108_22 for locations and quantities.
19	2527-9263190	SYMBOLS AND LEGENDS REMOVED	EACH	16	Refer to Tab. 108_29 for locations and details
20	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	102.96	Refer to Tab. 108_22 for locations and quantities. Refer to J Sheets for details.
21	2527-9263231	REMOVABLE TAPE MARKINGS, WET RETROREFLECTIVE	STA	166.33	
22	2527-9270112	GROOVES CUT FOR PAVEMENT MARKINGS	STA	102.96	Refer to Tab. 108_22 for locations and quantities.
23	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	3,350	Refer to Detail 8210 Modified in the B Sheets, Tab. 108_33, and J Sheets for location and details. All temporary barrier rail shall be nominal 12'-6" long concrete units.
24	2528-8445110	TRAFFIC CONTROL	LS	1	Refer to Traffic Control Plan on J Sheets.
25	2528-9290050	PORTABLE DYNAMIC MESSAGE SIGN (PDMS)	CDAY	0	See Proposal.
26	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	16.64	Refer to Tab. 112_10 for locations and details. Outside shoulders rumble strips shall be U.A.C.
27	2551-0000110	TEMP CRASH CUSHION	EACH	4	Refer to Tab. 108_30, B and J Sheets for locations and details. Winterize sand filled or water filled crash cushions according to the manufacturer's recommendations if they are to remain in place during winter months.
28	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	5,260	Refer to Tab. 100_19. The tabulation includes estimated locations for placement of "Perimeter and Slope Sediment Control Device, 20 in. dia." to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
29	2602-0000351	REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE	LF	5,260	

111_25 10/20/26		
INDEX OF TABULATIONS		
Tabulation	Tabulation Title	Sheet No.
	C SHEETS	
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105_04	STANDARD ROAD PLANS	C.4
100_19	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	C.5
100_28	LONGITUDINAL GROOVING	C.6
102_05	EXISTING PAVEMENT	C.7
103_10	TOPSOIL STRIPPING AND PLACEMENT	C.8
107_23	GRADING FOR GUARDRAIL INSTALLATIONS	C.9
108_08A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION	C.10
108_22	PAVEMENT MARKING LINE TYPES	C.11
108_29	PAVEMENT MARKING SYMBOLS AND LEGENDS	C.13
108_30	CRASH CUSHIONS	C.14
108_33	TEMPORARY BARRIER RAIL	C.15
110_01	REMOVAL OF PAVEMENT	C.16
110_07A	REMOVAL OF STEEL BEAM GUARDRAIL	C.17
112_04	CURBS AND RAISED ISLANDS	C.18
112_09	SHOULDERS	C.19
112_10	MILLED RUMBLE STRIPS	C.20
232_03A	EROSION CONTROL (RURAL SEEDING)	C.21
232_03C	EROSION CONTROL (NATIVE GRASS SEEDING)	C.21
232_11	EROSION CONTROL (STABILIZING CROP SEEDING)	C.21
262_06	UTILITIES (NOT A POINT 25 PROJECT)	C.21
	J SHEETS	
108_23A	TRAFFIC CONTROL PLAN	J.1
108_25	511 TRAVEL RESTRICTIONS	J.2
108_26A	STAGING NOTES	J.3
111_01	COORDINATED OPERATIONS	J.4

Number	Date	Title
BA-200	10-20-26	Steel Beam Guardrail Components
BA-201	10-18-22	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-26	Steel Beam Guardrail Bolted End Anchor
BA-205	10-17-23	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-250	10-20-26	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)
BA-401	04-20-21	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-21	Temporary Crash Cushions Sand Barrel
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
EC-502	04-21-15	Seeding in Rural Areas
EW-301	10-20-26	Guardrail Grading
PM-110	10-15-24	Line Types
PM-111	04-21-20	Symbols and Legends
PM-115	10-20-26	Grooving for Line Types
PV-12	10-20-26	Milled Shoulder Rumble Strips
PV-101	10-20-26	Joints
PV-102	10-21-25	PCC Curb Details
SI-173	04-19-16	Object Markers
SI-211	10-18-22	Object Marker and Delineator Placement with Guardrail
SI-881	10-20-26	Special Signs for Workzones
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-402	04-18-23	Work Within 15 ft of Traveled Way
TC-418	04-18-23	Lane Closure on Divided Highway
TC-421	10-21-25	Lane Closure with TBR
TC-432	10-17-17	Shoulder Rumble Strip Operations
TC-433	10-17-17	Pavement Marking Operations

100_19
10/15/24

PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

Possible Standards: EC-204

Line No.	Station From	Station To	Side	Sediment Control Device Type	Diameter Size	Length (LF)	Remarks
1.0	883+75.00	889+60.00	Right	Perimeter and Slope	20 inch	620.00	EB US 20
2.0	883+75.00	889+60.00	Median	Perimeter and Slope	20 inch	600.00	EB US 20
3.0	884+70.00	889+45.00	Median	Perimeter and Slope	20 inch	480.00	WB US 20
4.0	884+70.00	889+45.00	Left	Perimeter and Slope	20 inch	480.00	WB US 20
5.0	896+75.00	900+95.00	Right	Perimeter and Slope	20 inch	460.00	EB US 20
6.0	896+75.00	900+95.00	Median	Perimeter and Slope	20 inch	440.00	EB US 20
7.0	896+75.00	902+20.00	Median	Perimeter and Slope	20 inch	560.00	WB US 20
8.0	896+75.00	902+20.00	Left	Perimeter and Slope	20 inch	560.00	WB US 20
4200.00							

Perimeter and Slope Sediment Control Device, 20 In. Dia. = 5,260 LF (Includes an additional 25% for field adjustments and replacements.)

100_28 8/15/22 LONGITUDINAL GROOVING			
Line No.	Location	Total (SY)	Remarks
1.0	893+14.13	3007.6	EB Bridge Deck
2.0	893+14.13	3007.6	WB Bridge Deck
		6015.2	

102_05

9/29/23

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	Sac	US-20	WB	75.05	81.94	2012		NHSX-020-2(116)--3H-81	PCC	10.5	GSB	10.5					MOORE_A76004	C.LST.			
2.0	Sac	US-20	EB	75.05	81.94	2012		NHSX-020-2(116)--3H-81	PCC	10.5	GSB	10.5					MOORE_A76004	C.LST.			

103_10
4/30/25

TOPSOIL STRIPPING AND PLACEMENT

Line No.	Road Identification	Dir. of Traffic	Station From	Station To	Topsoil Stripping Thickness (IN)	Topsoil Placement Thickness (IN)	Remarks
1.0	US 20	EB	886+46.11	889+38.57	8.0	8.0	Stage 1A - 6.58 CY (Stripping)
2.0	US 20	EB	887+31.63	889+43.24	8.0	8.0	Stage 2A - 20.62 CY (Stripping)
3.0	US 20	WB	896+95.55	899+37.71	8.0	8.0	Stage 1B - 11.34 CY (Stripping)
4.0	US 20	WB	897+00.52	889+67.77	8.0	8.0	Stage 2B - 6.11 CY (Stripping)

Topsoil, Strip, Salvage & Spread = 44.7 CY
Topsoil, Furnish and Spread = 90.0 CY

107_23

8/15/22

GRADING FOR GUARDRAIL INSTALLATIONS

Refer to EW-301.

(1) Lane(s) to which the installation is adjacent.

Line No.	Direction of Traffic (1)	Station	Side	Foreslope at Guardrail	X1 (FT)	Y1 (FT)	X2 (FT)	Y2 (FT)	X3 (FT)	Y3 (FT)	X4 (FT)	Y4 (FT)	Z (FT)	Excavation Class 10 (CY)	Embankment-in-Place (CY)	Remarks
1.0	EB	889+38.57	Median	MatchExist	194.0	5.0					250.3	6.7	45.8		64.0	Stage 1A
2.0	EB	889+43.23	Right	MatchExist	105.0	5.0					162.7	8.5	52.0		46.4	Stage 2A
3.0	WB	896+95.96	Median	MatchExist	131.6	5.0					187.5	8.5	52.0		51.7	Stage 1B
4.0	WB	897+00.91	Left	MatchExist	156.6	5.0					214.7	6.7	45.8		56.3	Stage 2B
															218.4	

108_08A

4/25/25

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Possible Standards: BA-200, BA-201, BA-202, BA-205, BA-206, BA-209, BA-210, BA-211, BA-221, BA-225, BA-250, BA-260, LS-625, LS-626, LS-630, LS-635, SI-172, SI-173 and SI-211.

(1) Lane(s) to which the obstacle is adjacent.

(2) Not a bid item. Incidental to guardrail installation.

Line No.	Direction of Travel (1)	Side	Station	Offset (FT)	Barrier Transition Section	Barrier Transition Section (EA)	End Terminal	End Terminal Count (EA)	VT1 (LF)	VF (LF)	VT2 (LF)	ET (LF)	BA-211 Station	BA-211 (Type)	SI-211 (Type) (2)	Delineator SI-172 Type 1 (EA) (2)	Object Marker Type 2 (EA) (2)	Object Marker Type 3 Lt (EA)(2)	Object Marker Type 3 Rt (EA)(2)	Bolted End Anchor BA-202 (Type)	Bolted End Anchor BA-202 (EA)	Steel Beam Guardrail BA-200 (LF)	Remarks		
1.0	EB	Median	889+38.57	27.6	BA-201	1	BA-205	1	203.125			47.70			3			1		A	1	162.5	NW Corner of EB Bridge		
2.0	EB	Right	889+43.23	68.3	BA-201	1	BA-205	1	106.375			47.70			3				1	A	1	75.0	SW Corner of EB Bridge		
3.0	WB	Median	896+95.96	27.6	BA-201	1	BA-205	1	140.625			47.70			3			1		A	1	100.0	SE Corner of WB Bridge		
4.0	WB	Left	897+00.91	68.2	BA-201	1	BA-205	1	165.625			47.70			3				1	A	1	125.0	NE Corner of WB Bridge		
					4				4									2		2		4		462.5	

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

Road ID	Station From	Station To	Line Length (STA)	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	BLW6 Factored (STA)	CHW8 Factored (STA)	CHY8 Factored (STA)	ELW6 Factored (STA)	ELY6 Factored (STA)	Remarks
US 20	870+90.00	889+53.00	18.63	EB	Removal of Paint	x	x		No		4.66				18.63	Prior to Stage 1A
US 20	884+84.23	900+54.42	15.70	EB	Removal of Paint			x	No					15.70		Prior to Stage 1A
US 20	896+75.00	900+54.42	3.79	EB	Removal of Paint		x		No		0.95					Prior to Stage 1A
US 20	885+48.00	889+42.42	3.94	WB	Removal of Paint		x		No		0.98					Prior to Stage 1B
US 20	885+48.00	901+60.00	16.12	WB	Removal of Paint			x	No					16.12		Prior to Stage 1B
US 20	896+86.00	901+60.00	4.74	WB	Removal of Paint	x	x		No		1.19				4.74	Prior to Stage 1B
US 20	896+76.22	900+54.42	3.78	EB	Removal of Paint	x			No						3.78	Prior to Stage 2A
US 20	885+48.00	889+44.71	3.97	WB	Removal of Paint	x			No						3.97	Prior to Stage 2B
Marking Type : Removal of Paint										0	7.78	0	0	31.82	31.12	
US 20	870+90.00	889+13.25	18.23	EB	Removal of Removable Tape	x			No				24.58			Prior to Stage 2A
US 20	897+06.00	900+54.42	3.48	EB	Removal of Removable Tape	x			No				4.66			Prior to Stage 2A
US 20	884+84.23	900+54.42	15.70	EB	Removal of Removable Tape			x	No			21.31				Prior to Stage 2A
US 20	885+48.00	889+12.78	3.65	WB	Removal of Removable Tape	x			No				4.66			Prior to Stage 2B
US 20	897+18.94	901+60.00	4.41	WB	Removal of Removable Tape	x			No				6.30			Prior to Stage 2B
US 20	885+48.00	901+60.00	16.12	WB	Removal of Removable Tape			x	No			21.44				Prior to Stage 2B
US 20	870+91.04	889+13.29	18.22	EB	Removal of Removable Tape			x	No			24.59				Stage 2A
US 20	884+00.00	900+54.41	16.54	EB	Removal of Removable Tape	x			No				22.20			Stage 2A
US 20	897+09.24	900+54.42	3.45	EB	Removal of Removable Tape			x	No			4.66				Stage 2A
US 20	885+48.00	889+15.05	3.67	WB	Removal of Removable Tape			x	No			4.81				Stage 2B
US 20	885+48.00	901+60.00	16.12	WB	Removal of Removable Tape	x			No				21.25			Stage 2B
US 20	897+18.97	901+60.00	4.41	WB	Removal of Removable Tape			x	No			5.87				Stage 2B
Marking Type : Removal of Removable Tape										0	0	82.68	83.65	0	0	
US 20	870+90.00	900+54.42	29.64	EB	Waterborne/Solvent Paint	x	x	x	Yes	66.69	7.41			29.64	29.64	Final Pavement Marking
US 20	885+48.00	901+60.00	16.12	WB	Waterborne/Solvent Paint	x	x	x	Yes	36.27	4.03			16.12	16.12	Final Pavement Marking
Marking Type : Waterborne/Solvent Paint										102.96	11.44	0	0	45.76	45.76	
US 20	870+90.00	889+13.25	18.23	EB	Wet Retroreflective Removable Tape	x			No				24.58			Stage 1A
US 20	897+06.00	900+54.42	3.48	EB	Wet Retroreflective Removable Tape	x			No				4.66			Stage 1A
US 20	884+84.23	900+54.42	15.70	EB	Wet Retroreflective Removable Tape			x	No			21.31				Stage 1A
US 20	885+48.00	889+12.78	3.65	WB	Wet Retroreflective Removable Tape	x			No				4.66			Stage 1B
US 20	897+18.94	901+60.00	4.41	WB	Wet Retroreflective Removable Tape	x			No				6.30			Stage 1B
US 20	885+48.00	901+60.00	16.12	WB	Wet Retroreflective Removable Tape			x	No			21.44				Stage 1B
US 20	870+91.04	889+13.29	18.22	EB	Wet Retroreflective Removable Tape			x	No			24.59				Stage 2A
US 20	884+84.32	900+54.41	15.70	EB	Wet Retroreflective Removable Tape	x			No				22.20			Stage 2A
US 20	897+09.24	900+54.42	3.45	EB	Wet Retroreflective Removable Tape			x	No			4.66				Stage 2A
US 20	885+48.00	889+15.05	3.67	WB	Wet Retroreflective Removable Tape			x	No			4.81				Stage 2B
US 20	885+48.00	901+60.00	16.12	WB	Wet Retroreflective Removable Tape	x			No				21.25			Stage 2B
US 20	897+18.97	901+60.00	4.41	WB	Wet Retroreflective Removable Tape			x	No			5.87				Stage 2B
Marking Type : Wet Retroreflective Removable Tape										0	0	82.68	83.65	0	0	

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
CBW6: Crosswalk Bar (White) @ 10.00 CHW8: Channelizing Line (White) @ 1.33 CHW10: Channelizing Line (White) @ 1.67
CLW6: Crosswalk Line (White) @ 2.00 DCY4: Double Centerline (Yellow) @ 1.34 DCY6: Double Centerline (Yellow) @ 2.00
DLW4: Dotted Line (White) @ 0.22 DLW6: Dotted Line (White) @ 0.33 DLY4: Dotted Line (Yellow) @ 0.22
ELW6: Edge Line Right (White) @ 1.00 ELY4: Edge Line Left (Yellow) @ 0.67 ELY6: Edge Line Left (Yellow) @ 1.00
MNY6: Median Nose (Yellow) @ 1.00 NPY4: No Passing Zone Line (Yellow) @ 0.84 NPY6: No Passing Zone Line (Yellow) @ 1.25
RLY4: Ramp Edge Line Left (Yellow) @ 0.67 RLY6: Ramp Edge Line Left (Yellow) @ 1.00 SLW2: Stop Line (White) @ 4.00
SPW4: Sloped Curb 4" (White) @ 2.16 SPW6: Sloped Curb 6" (White) @ 2.28 SPY4: Sloped Curb 4" (Yellow) @ 2.16
STY6: Standard Curb 6" (Yellow) @ 2.03 YLW2: Yield Line (White) @ 1.15

BLW4: Broken Lane Line (White) @ 0.17 BLW6: Broken Lane Line (White) @ 0.25
CHY8: Channelizing Line (Yellow) @ 1.33 CHY10: Channelizing Line (Yellow) @ 1.67
DDY4: Double Dotted Line (Yellow) @ 0.44 DDY6: Double Dotted Line (Yellow) @ 0.67
DLY6: Dotted Line (Yellow) @ 0.33 ELW4: Edge Line Right (White) @ 0.67
LDW8: Lane Drop (White) @ 0.33 LDW10: Lane Drop (White) @ 0.42
RLW4: Ramp Edge Line Right (White) @ 0.67 RLW6: Ramp Edge Line Right (White) @ 1.00
SLW4: Solid Lane Line (White) @ 0.67 SLW6: Solid Lane Line (White) @ 1.00
SPY6: Sloped Curb 6" (Yellow) @ 2.28 STW6: Standard Curb 6" (Yellow) @ 2.03

Road ID	Station From	Station To	Line Length (STA)	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	BLW6 Factored (STA)	CHW8 Factored (STA)	CHY8 Factored (STA)	ELW6 Factored (STA)	ELY6 Factored (STA)	Remarks
Grand Totals											102.96	19.22	165.36	167.30	77.58	76.88

Line No.	Roadway Identification	Station	Side	Pavement Symbol	Quantity (EA)	Groove Marking Needed?	Remarks
1.0	US 20	848+40.00	Median	LLRW	1	No	Stage 1A - EB
2.0	US 20	849+40.00	Median	LLRW	1	No	Stage 1A - EB
3.0	US 20	858+40.00	Median	LLRW	1	No	Stage 1A - EB
4.0	US 20	859+40.00	Median	LLRW	1	No	Stage 1A - EB
5.0	US 20	938+25.00	Median	LLRW	1	No	Stage 1B - WB
6.0	US 20	939+25.00	Median	LLRW	1	No	Stage 1B - WB
7.0	US 20	948+25.00	Median	LLRW	1	No	Stage 1B - WB
8.0	US 20	949+25.00	Median	LLRW	1	No	Stage 1B - WB
9.0	US 20	848+40.00	Right	RLRW	1	No	Stage 2A - EB
10.0	US 20	849+40.00	Right	RLRW	1	No	Stage 2A - EB
11.0	US 20	858+40.00	Right	RLRW	1	No	Stage 2A - EB
12.0	US 20	859+40.00	Right	RLRW	1	No	Stage 2A - EB
13.0	US 20	938+25.00	Left	RLRW	1	No	Stage 2B - WB
14.0	US 20	939+25.00	Left	RLRW	1	No	Stage 2B - WB
15.0	US 20	948+25.00	Left	RLRW	1	No	Stage 2B - WB
16.0	US 20	949+25.00	Left	RLRW	1	No	Stage 2B - WB
16							

108_30
4/16/24

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	EB	888+62.50	Median	1.9	Temporary	1								TBR	Stage 1A
2.0	WB	897+71.00	Median	1.9	Temporary	1								TBR	Stage 1B
3.0	EB	888+62.50	Right	1.9	Temporary	1								TBR	Stage 2A
4.0	WB	897+71.00	Left	1.9	Temporary	1								TBR	Stage 2B
						4									

								108_33 8/15/22
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	888+62.50	897+08.00	837.5	Concrete BA-401	No	No	Stage 1A - EB
2.0	2	889+12.50	897+71.00	837.5	Concrete BA-401	No	No	Stage 1B - WB
3.0	3	888+62.50	897+08.00	837.5	Concrete BA-401	No	No	Stage 2A - EB
4.0	4	889+12.50	897+71.00	837.5	Concrete BA-401	No	No	Stage 2B - WB
				3350.0				

110_01
4/5/24

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	884+00.00	889+35.25	EB	PCC	347.2	553.0	Prior to Stage 1A - Outside Shoulder
2.0	896+94.85	900+75.00	EB	PCC	169.0	396.0	Prior to Stage 1A - Outside Shoulder
3.0	885+00.00	889+20.72	WB	PCC	187.0	422.0	Prior to Stage 1B - Outside Shoulder
4.0	897+07.50	902+00.00	WB	PCC	459.1	500.0	Prior to Stage 1B - Outside Shoulder
5.0	884+00.00	889+35.07	EB	PCC	447.0	550.0	Stage 1A - Inside Shoulder
6.0	896+94.85	900+75.00	EB	PCC	169.0	392.0	Stage 1A - Inside Shoulder
7.0	885+00.00	889+20.96	WB	PCC	187.1	425.0	Stage 1B - Inside Shoulder
8.0	897+07.29	902+00.00	WB	PCC	353.3	500.0	Stage 1B - Inside Shoulder
					2318.7	3738.0	

110_07A
8/15/22

REMOVAL OF STEEL BEAM 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 of Guardrail (2) (LF)
1.0	1	EB	885+75.00	889+38.00	Median	265.0
2.0	2	EB	888+02.00	889+44.00	Right	145.0
3.0	3	WB	896+95.00	898+67.00	Median	170.0
4.0	4	WB	897+00.00	899+23.00	Left	220.0
						800.0

112_04 8/15/22									
CURBS AND RAISED ISLANDS									
Refer to PV-20, PV-102, and 6000s Detail Series.									
(1) Bid Item									
Line No.	Point No.	Station	Offset (FT)	Island Interior Area (1) (SY)	Curb Type	Curb Height (IN)	Gutter Width (FT)	Length (1) (FT)	Remarks
1.0	1	889+25.56	26.3		Dowelled PCC	4.0	1.4	12.5	Stage 1A - EB Median - See U Sheets for Details
2.0	2	889+30.41	69.7		Dowelled PCC	4.0	1.4	12.5	Stage 2B - EB Outside - See U sheets for Details
3.0	3	896+96.57	26.3		Dowelled PCC	4.0	1.4	12.5	Stage 1B - WB Median - See U sheets for Details
4.0	4	897+01.53	68.9		Dowelled PCC	4.0	1.4	12.5	Stage 2B - WB Outside - See U sheets for Details
50.0									

112_09
4/21/26

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)	Paved Shoulder (3) (SY)	Paved Shoulder at Grdrail (5)(7) (SY)	Special Backfill PCC Alt. (3) (TON)	Special Backfill PCC Alt. (TON/STA)	Subbase (3) (8) (CY)	Granular Shoulder (3) (TON)	Granular Shoulder (TON/STA)	Earth Shoulder Const. Alt (3) (STA)	Earth Shoulder Const. Alt PCC (6) (CY)	Remarks
US 20	EB	884+00.00	887+63.65	Right	8	0	0	363.65	184.2	323.2		188.900	51.940				3.64	103.98	Prior to Stage 1A. 8" PCC over 8.5" Special Backfill
US 20	EB	887+63.65	889+35.25	Right	8	0	0	171.60	44.5	152.5		60.310	35.140						Prior to Stage 1A. 8" PCC over 8.5" Special Backfill
US 20	EB	896+94.85	900+75.00	Right	8	0	0	380.15	192.5	337.9		197.470	51.940				3.80	108.69	Prior to Stage 1A. 8" PCC over 8.5" Special Backfill
US 20	WB	885+00.00	889+20.72	Left	8	0	0	420.72	213.1	374.0		218.550	51.940				4.21	120.29	Prior to Stage 1B. 8" PCC over 8.5" Special Backfill
US 20	WB	897+07.53	899+41.16	Left	8	0	0	233.63	60.6	207.7		82.110	35.140						Prior to Stage 1B. 8" PCC over 8.5" Special Backfill
US 20	WB	899+41.16	902+00.00	Left	8	0	0	258.84	132.4	230.1		134.460	51.940				2.59	74.01	Prior to Stage 1B. 8" PCC over 8.5" Special Backfill
US 20	EB	884+00.00	886+69.94	Median	6	0	0	269.94	109.2	180.0		113.450	42.000				2.70	77.18	Stage 1A. 8" PCC over 6" & 8.5" Special Backfill
US 20	EB	886+69.94	886+89.79	Median	6	2.6	0	19.85	6.4	13.2	5.7	7.510	37.800				0.20	5.22	Stage 1A. 8" PCC over 6" & 8.5" Special Backfill
US 20	EB	886+89.79	887+36.63	Median	6	2.1	0	46.84	14.3	31.2	10.7	16.820	35.910				0.47	12.32	Stage 1A. 8" PCC over 6" & 8.5" Special Backfill
US 20	EB	887+36.63	889+35.07	Median	6	1.5	0	198.44	67.5	132.3	31.0	67.430	33.950				1.98	52.18	Stage 1A. 8" PCC over 6" & 8.5" Special Backfill
US 20	EB	896+94.85	900+75.00	Median	6	0.0	0	380.15	155.8	253.4		159.770	42.000				3.80	108.69	Stage 1A. 8" PCC over 8.5" Special Backfill
US 20	WB	885+00.00	889+20.96	Median	6	0.0	0	420.96	172.5	280.6		176.930	42.000				4.21	120.36	Stage 1B. 8" PCC over 8.5" Special Backfill
US 20	WB	897+07.29	898+35.13	Median	6	1.7	0	127.84	44.3	85.2	23.8	44.330	34.650				1.28	33.62	Stage 1B. 8" PCC over 6" & 8.5" Special Backfill
US 20	WB	898+35.13	898+85.70	Median	6	3.1	0	50.57	17.2	33.7	17.4	20.020	39.550				0.51	13.30	Stage 1B. 8" PCC over 6" & 8.5" Special Backfill
US 20	WB	898+85.70	899+05.87	Median	6	4.5	0	20.17	7.8	13.5	10.1	8.970	44.450				0.20	5.30	Stage 1B. 8" PCC over 6" & 8.5" Special Backfill
US 20	WB	899+05.87	902+00.00	Median	6	0.0	0	294.13	120.5	196.1		123.620	42.000				2.94	84.10	Stage 1B. 8" PCC over 8.5" Special Backfill
US 20	EB	887+63.67	887+83.28	Right	0	4.5	0	19.61	2.9		9.8	3.770	19.250				0.20	5.16	Stage 2A. 8" PCC over 6" Special Backfill
US 20	EB	887+83.28	888+32.62	Right	0	3.2	0	49.34	5.5		17.3	7.170	14.560				0.49	12.97	Stage 2A. 8" PCC over 6" Special Backfill
US 20	EB	888+32.62	889+30.41	Right	0	1.8	0	97.79	7.6		19.0	9.410	9.660				0.98	25.72	Stage 2A. 8" PCC over 6" Special Backfill
US 20	WB	897+14.30	898+70.08	Left	0	1.5	0	155.78	11.2		26.0	13.630	8.750				1.56	40.96	Stage 2B. 8" PCC over 6" Special Backfill
US 20	WB	898+70.08	899+18.96	Left	0	2.2	0	48.88	4.5		11.9	5.670	11.200				0.49	12.85	Stage 2B. 8" PCC over 6" Special Backfill
US 20	WB	899+18.96	899+39.40	Left	0	2.9	0	20.44	2.2		6.6	2.790	13.650				0.20	5.37	Stage 2B. 8" PCC over 6" Special Backfill
									1576.71	2844.66	189.14	1663.090							36.45 1022.27

112_10

10/20/26

RUMBLE STRIPS

* Calculated at 18" width for Shoulder.

** For use with penetrating Engineered Fog Seal. Calculated at 2" wider than rumble strips.

Line No.	Road Identification	Station From	Station To	Surface Type	Rumble Strip Lane	Rumble Strip Type	Fog Seal Type	L (IN)	PCC Length (STA)	HMA Length (STA)	Fog Seal* Shoulder (GAL)	Fog Seal (SY)**	Effective Shoulder Width PCC (FT)	Effective Shoulder Width HMA (FT)	Effective Shoulder Width Granular\Earth (FT)	Remarks
1.0	US 20	884+00.00	888+90.00	PCC	Left Shoulder	Milled Shoulder Rumble Strips		12"	4.90				6.0			EB - Inside Shoulder
2.0	US 20	885+00.00	888+83.00	PCC	Right Shoulder	Milled Shoulder Rumble Strips		12"	3.83				6.0			WB - Inside Shoulder
3.0	US 20	897+39.00	900+75.00	PCC	Left Shoulder	Milled Shoulder Rumble Strips		12"	3.36				6.0			EB - Inside Shoulder
4.0	US 20	897+45.00	902+00.00	PCC	Right Shoulder	Milled Shoulder Rumble Strips		12"	4.55				6.0			WB - Inside Shoulder
									16.64							

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.	

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 debarred 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.	

232_11 6/21/23	
EROSION CONTROL (STABILIZING CROP 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.	
If outside of permanent seeding dates in Section 2601 of the Standard Specifications, or if required by a storm water permit, place stabilizing crop, fertilizer, and mulch on the disturbed area as follows:	
Place seed and fertilize according to the requirements of Article 2601.03,C,1 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 incidental to mobilization and will 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.	

SURVEY SYMBOLS

	Interstate Highway Symbol		Septic Tank
	U.S. Highway Symbol		Cistern
	Iowa Highway Symbol		L.P. Gas Tank (No Footing)
	County Road Highway Symbol		Underground Storage Tank
	Evergreen Tree		Latrine
	Deciduous Tree		Satellite TV Dish
	Fruit Tree		Water Hook Up
	Shrub (Bushes)		Radio Tower
	Timber		Tower Anchor
	Hedge		Guardrail (Beam or Cable)
	Stump		Guard Post (one or two)
	Swamp		Guard Post (over two)
	Rock Outcrop		Filler Pipe
	Broken Concrete		Gas Valve
	Revetment (Rip Rap)		Water Valve
	Cemetery		Speed Limit Sign
	Grave		Mile Marker Post
	Cave		Sign
	Sink Hole		Traffic Signal Control Box
	Board Fence		Rail Road Signal Control Box
	Chain Link or Security Fence		Telephone Switch Box
	Wire Fence		Electric Box
	Terrace		
	Earth Dam or Dike (Existing)		
	Tile Outlet		
	Edge of Water		
	Existing Drainage		
	Right of Way Rail or Lot Corner		
	Concrete Monument		
	Well		
	Windmill		
	Beehive Intake		
	Existing Intake		
	Existing Utility Access (Manhole)		
	Fire Hydrant		
	Water Hydrant (Rural)		

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	Design Color No.	
Lavender	(9)	Temporary Pavement Shading
Yellow	(4)	Proposed Pavement Shading
Orange	(6)	Proposed Granular Shading
Orange	(70)	Proposed Shoulder Granular Shading
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Orange, Light	(134)	Proposed Granular Entrance Shading
Yellow	(220)	Proposed Paved Entrance Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading
Green, Light	(225)	Existing Pavement Shading
Red	(3)	Proposed Structure Shading
Red	(3)	Delineates Restricted Areas
Gray	(64)	Revetment

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(10)	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	Survey Line
	Station	
	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)

FILE NO. 32563

ENGLISH

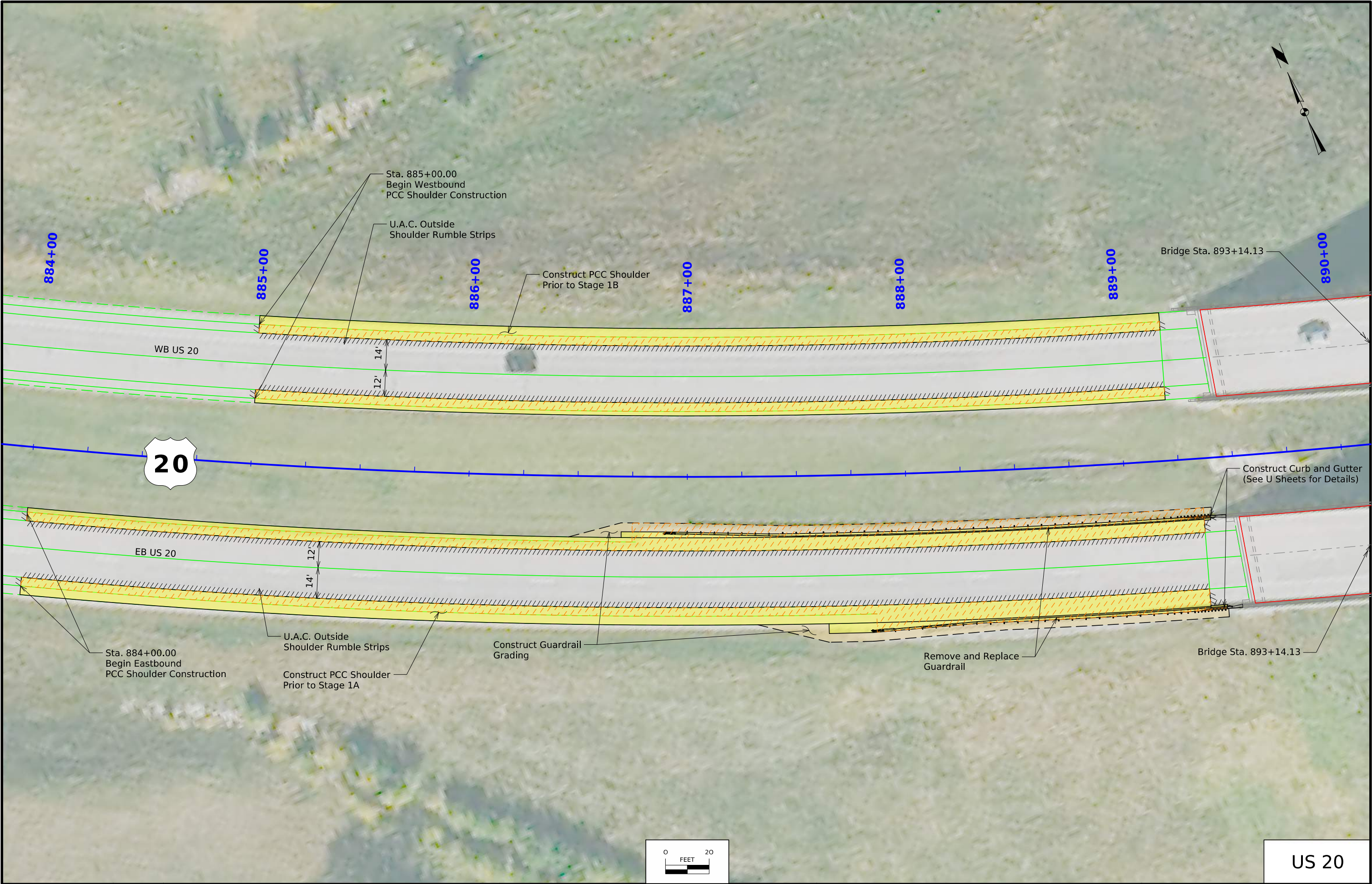
DESIGN TEAM HNTB

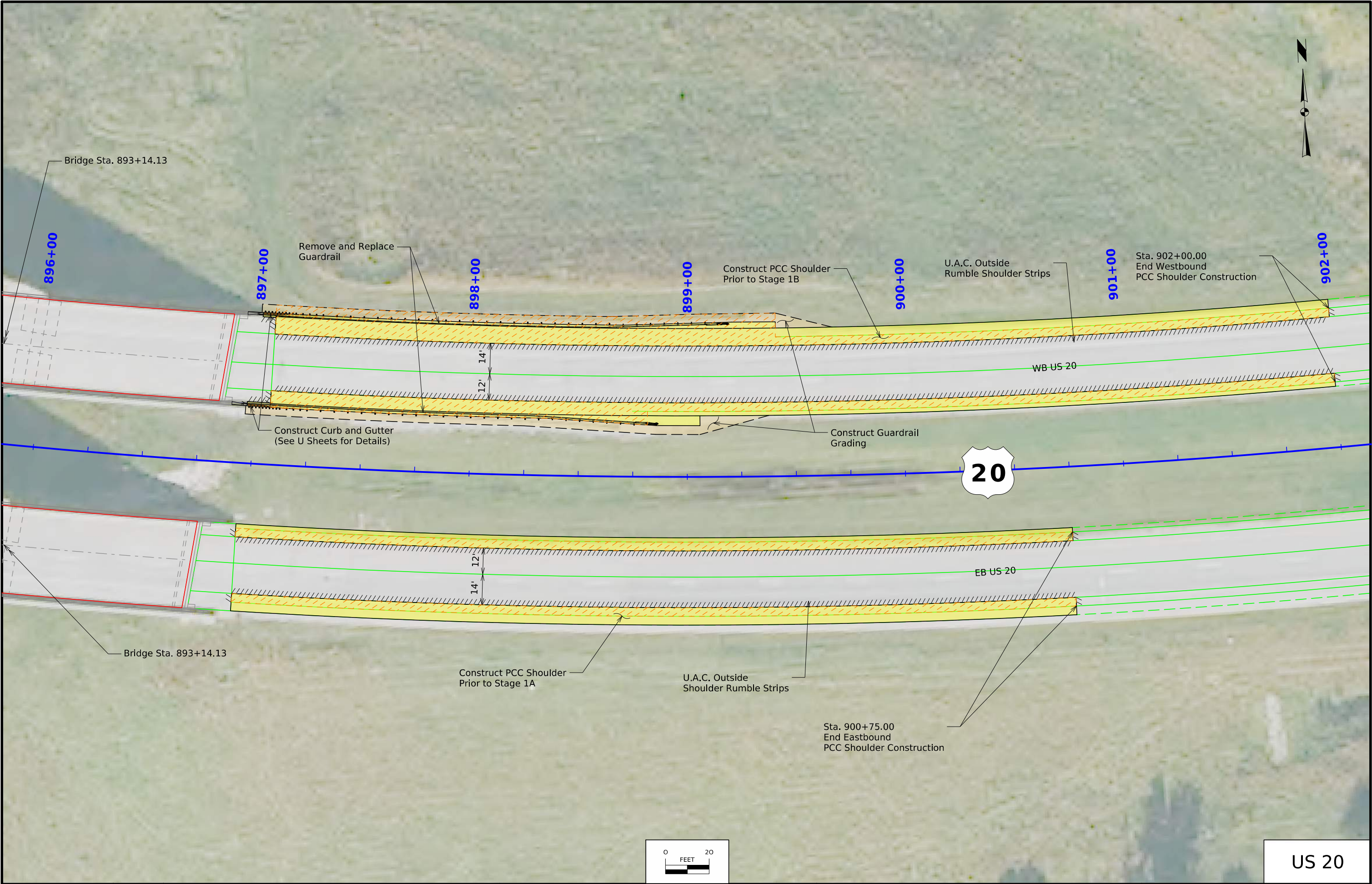
SAC

COUNTY

PROJECT NUMBER BRF-020-2(156)--38-81

SHEET NUMBER D.1





Maintain one lane of traffic on WB and EB US 20 at all times in accordance with J Sheets and Standard Road Plans listed in Tab. 105_04.

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

Refer to Tab. 108-26A for Staging Notes.

All side roads and median turnarounds are to remain open.

PDMS shall be used 14 days prior to lane closures.

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 20	WB	Sac	North Raccoon River 1.0 mi W of Co Rd M54	North Raccoon River	Barrier	FHWA No. 700085	Horizontal	N/A	15' - 6"	N/A	N/A	
2.0	US 20	EB	Sac	North Raccoon River 1.0 mi W of Co Rd M54	North Raccoon River	Barrier	FHWA No. 700080	Horizontal	N/A	15' - 6"	N/A	N/A	

STAGING NOTES

Prior to Stage 1A

Traffic: Close eastbound outside lane in accordance with Standard Road Plan TC-418.

Construction: Construct PCC shoulder on eastbound outside shoulder for shifting traffic in Stage 1A.

Prior to Stage 1B

Traffic: Close westbound outside lane in accordance with Standard Road Plan TC-418.

Construction: Construct PCC shoulder on westbound outside shoulder for shifting traffic in Stage 1B.

Stage 1A

Traffic: Shift eastbound traffic to outside lane in accordance with the J Sheets and TC-421.
All sideroads are to remain open.

Construction: Construct bridge repairs and deck overlay on the inside of eastbound bridge.
Remove and replace guardrail and pave shoulder at guardrail on the inside of eastbound bridge.
Construct PCC shoulder for shifting traffic in Stage 2A.
Complete other Stage 1A construction.

Stage 1B

Traffic: Shift westbound traffic to the outside lane in accordance with the J Sheets and TC-418.
All sideroads are to remain open.

Construction: Construct bridge repairs and deck overlay on the inside of westbound bridge.
Remove and replace guardrail and pave shoulder at guardrail on the inside of westbound bridge.
Construct PCC shoulder for shifting traffic in Stage 2B.
Complete other Stage 1B construction.

Stage 2A

Traffic: Shift eastbound traffic to the inside lane in accordance with the J Sheets and TC-421.
All sideroads are to remain open.

Construction: Construct bridge repairs and deck overlay on the outside of eastbound bridge.
Remove and replace guardrail and pave shoulder at guardrail on the outside of eastbound bridge.
Complete other Stage 2A construction.

Stage 2B

Traffic: Shift westbound traffic to the inside lane in accordance with the J Sheets and TC-418.
All sideroads are to remain open.

Construction: Construct bridge repairs and deck overlay on the outside of westbound bridge.
Remove and replace guardrail and pave shoulder at guardrail on the outside of westbound bridge.
Complete other Stage 2B construction.

Final

Traffic: Open all lanes to traffic.
Complete shoulder rumble strip operations in accordance with Standard Road Plan TC-432.
Complete pavement markings operations in accordance with Standard Road Plan TC-433.

Construction: Complete final pavement markings and shoulder rumble strips as detailed in C sheets.

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	

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS		
SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS			
	Pavement Removal		Proposed Granular Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail, Pinned		Permanent Barrier Rail
	Temporary Barrier Rail, Unpinned		Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS		
LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

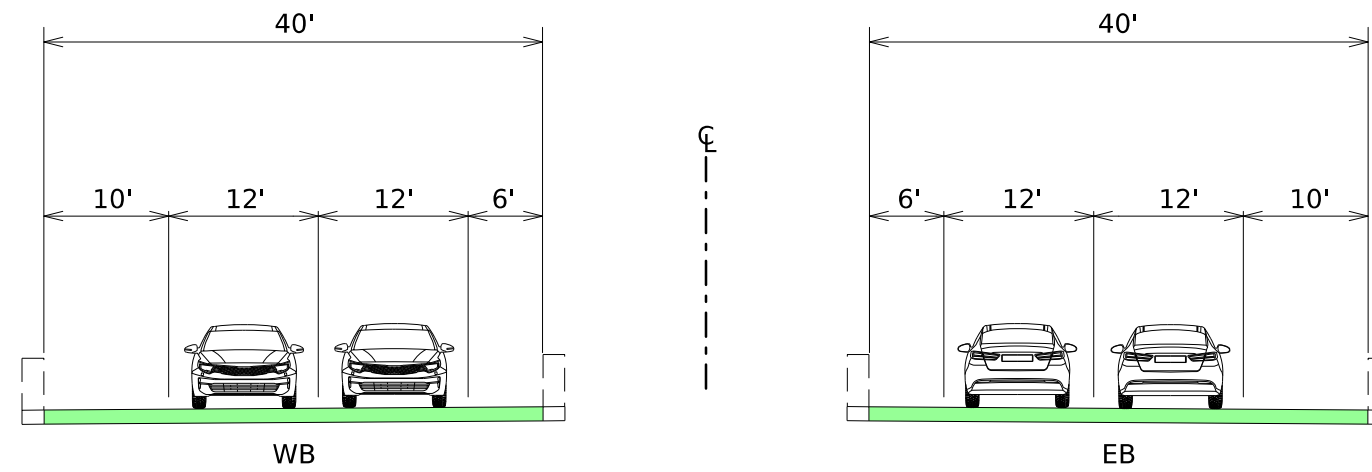
SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS			
	Channelizing Device		Crash Cushion (Temp or Perm)
	Drum		Traffic Signal
	Temporary Lane Separator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout		Lane Identification
	Speed Feedback Sign		Arrow Board

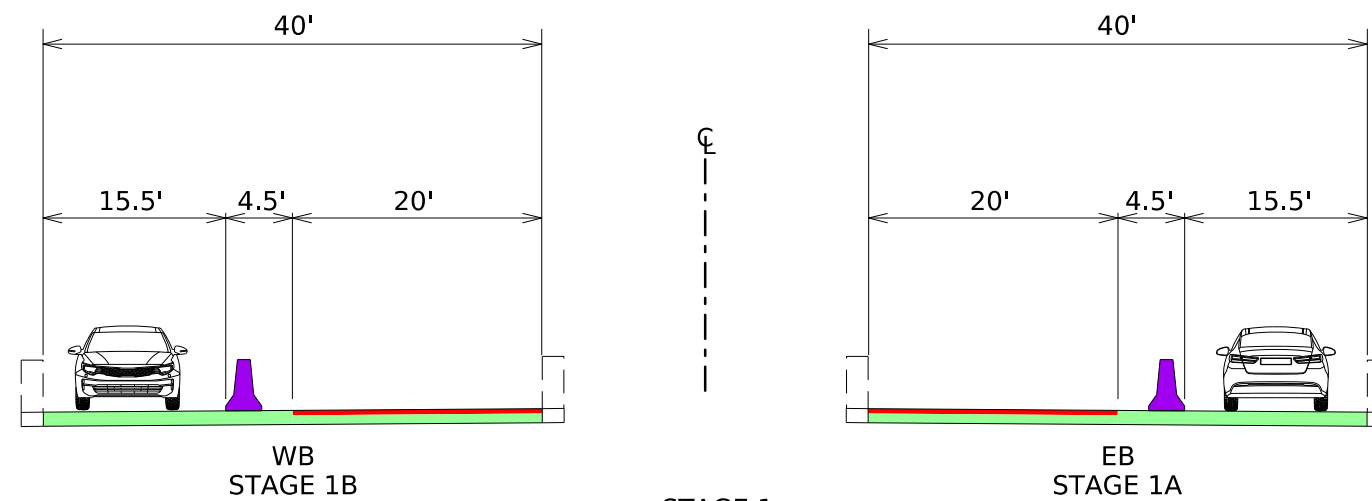
NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL
AND
STAGING
LEGEND AND SYMBOL
INFORMATION SHEET

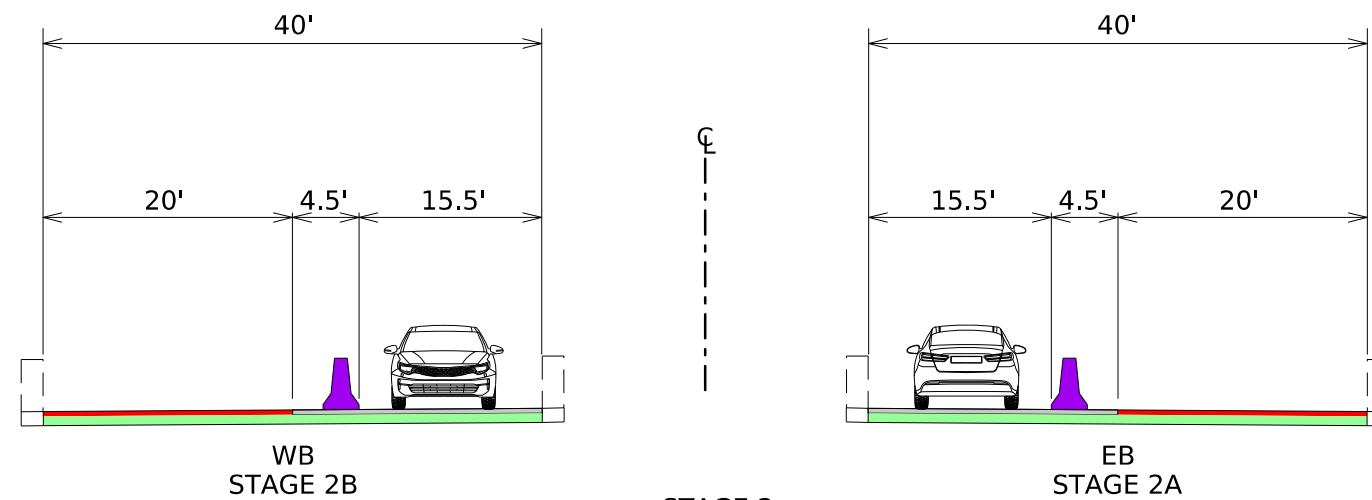
(COVERS SHEET SERIES J)



EXISTING
(LOOKING AHEAD STATION)

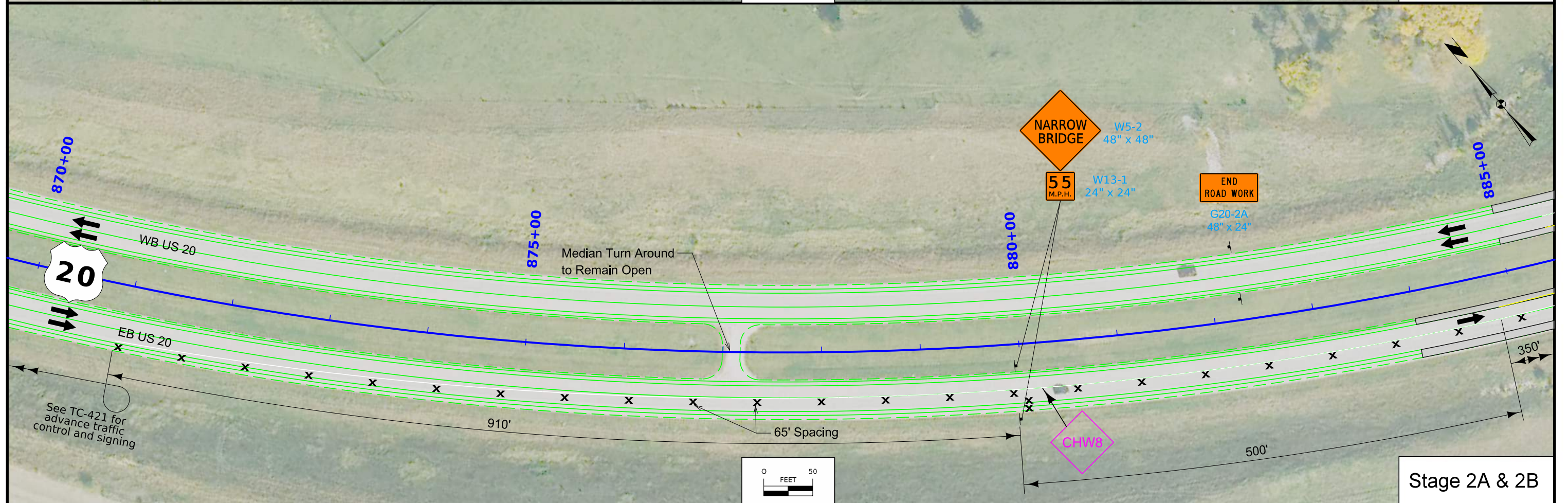
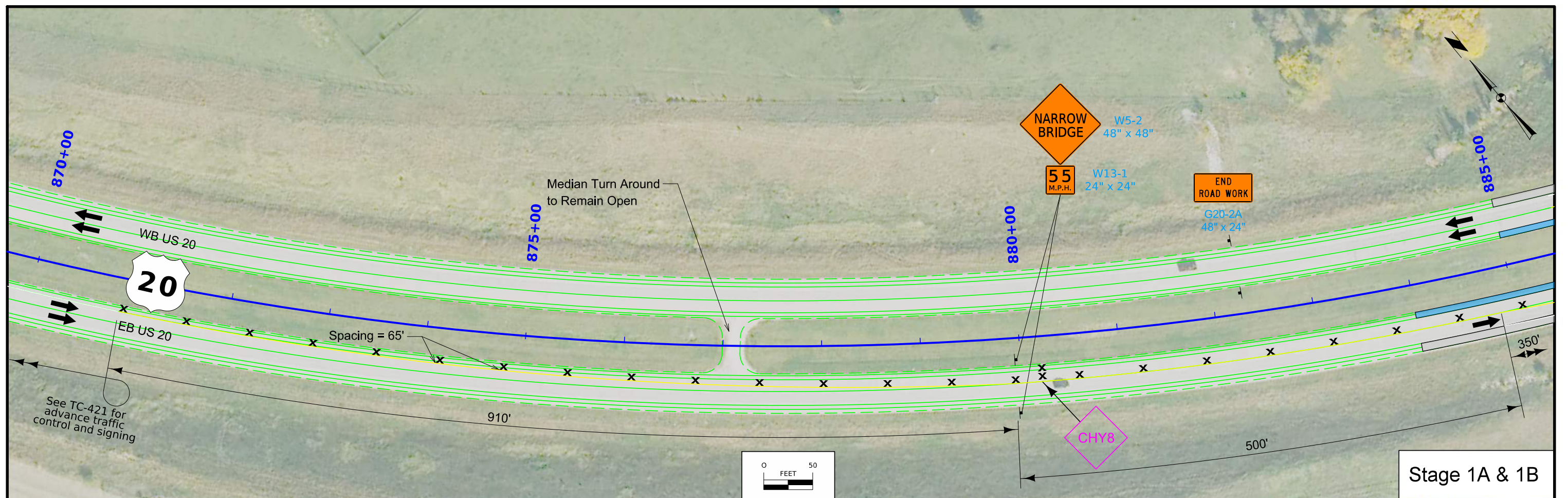


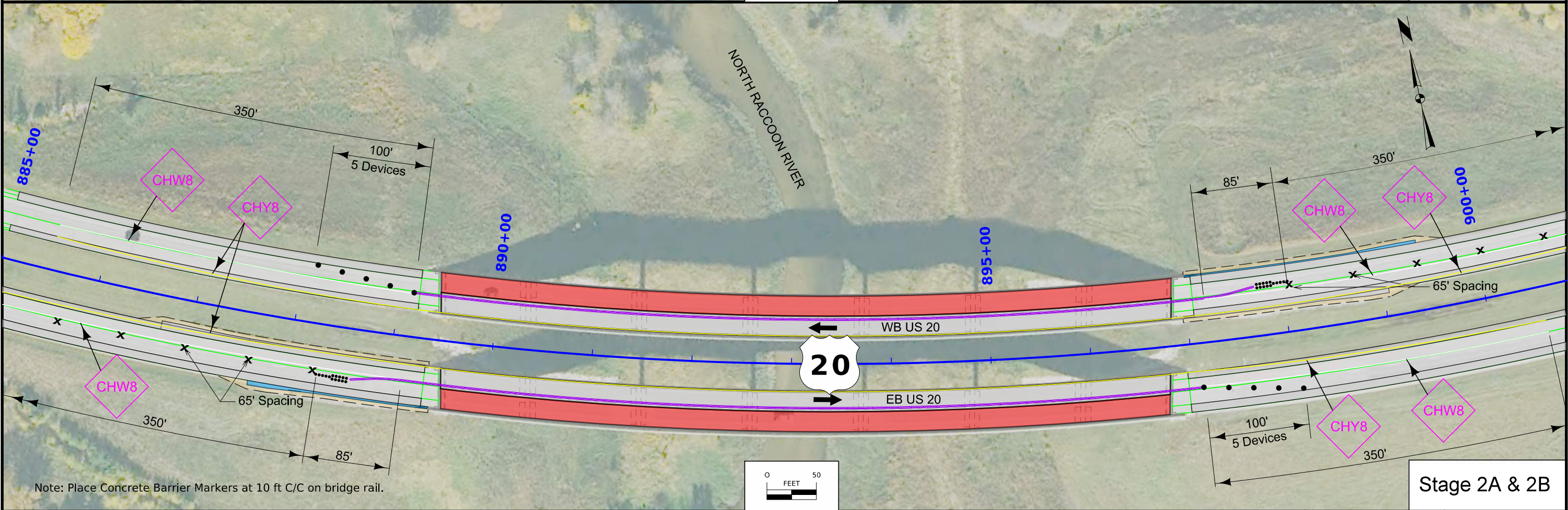
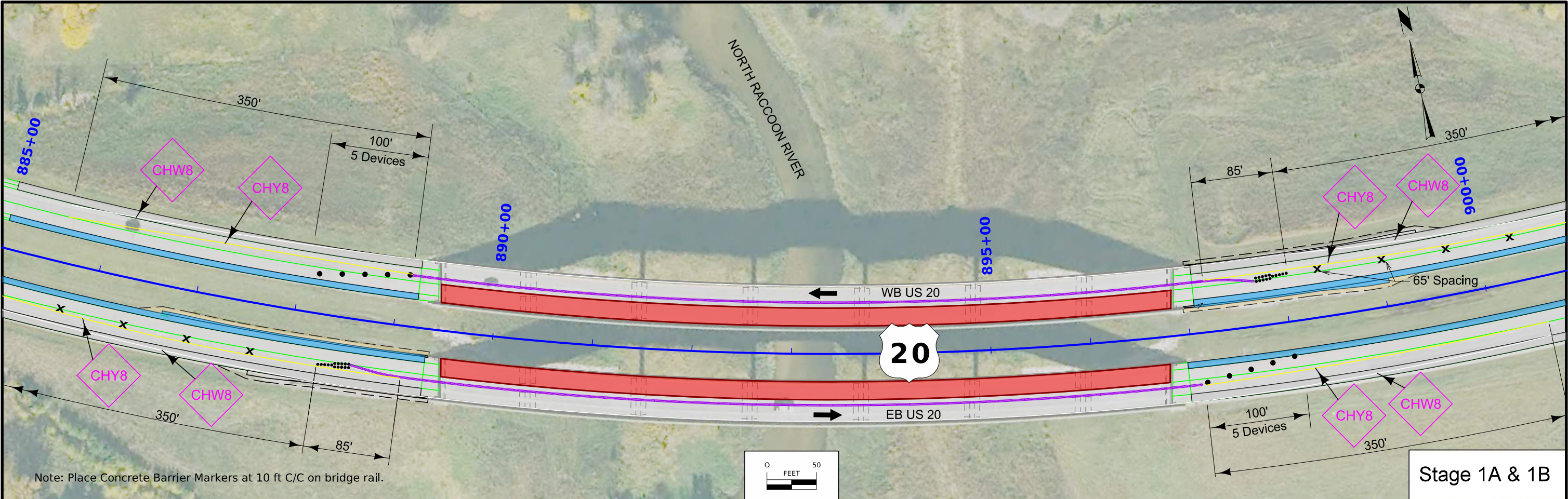
STAGE 1
(LOOKING AHEAD STATION)

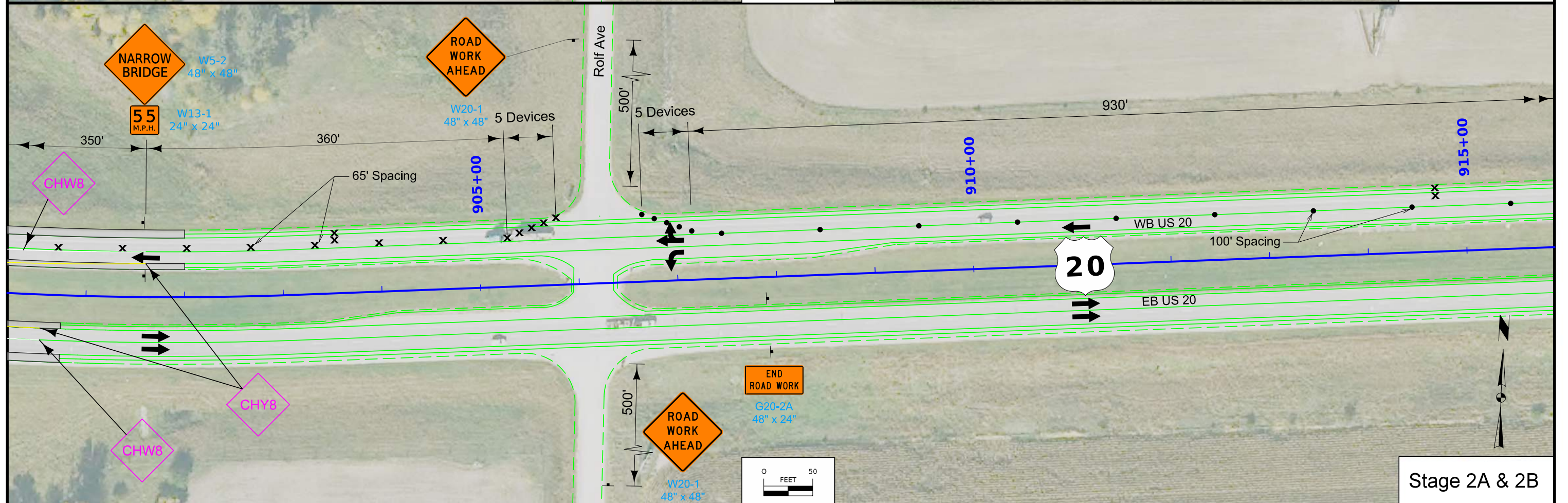
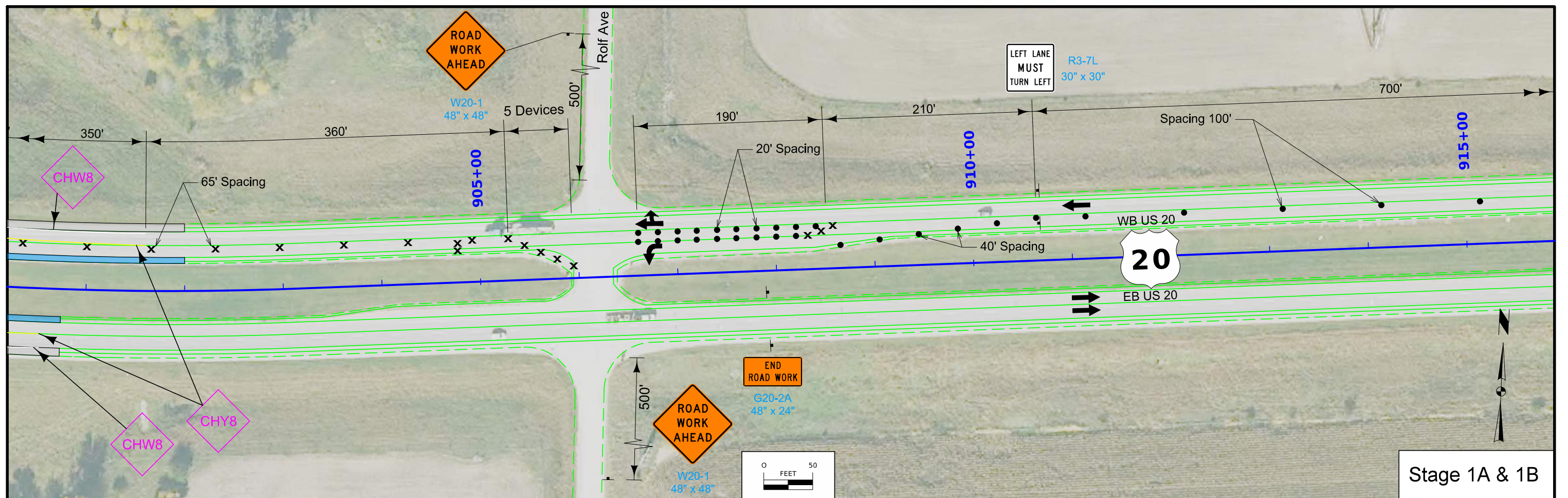


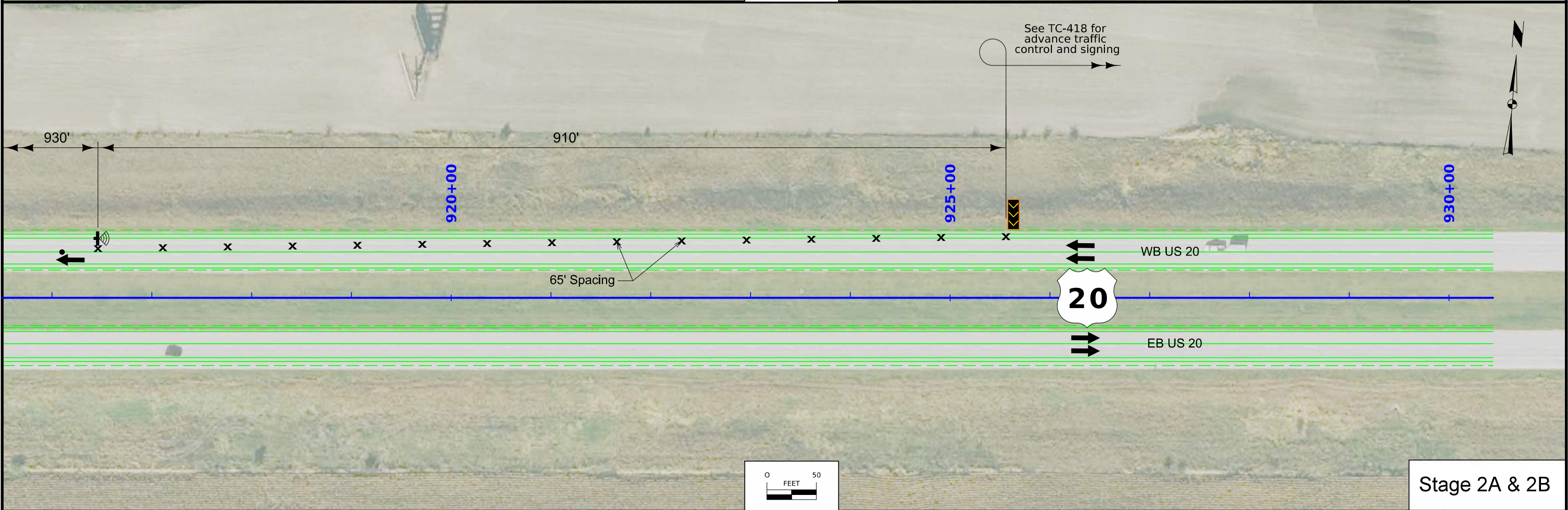
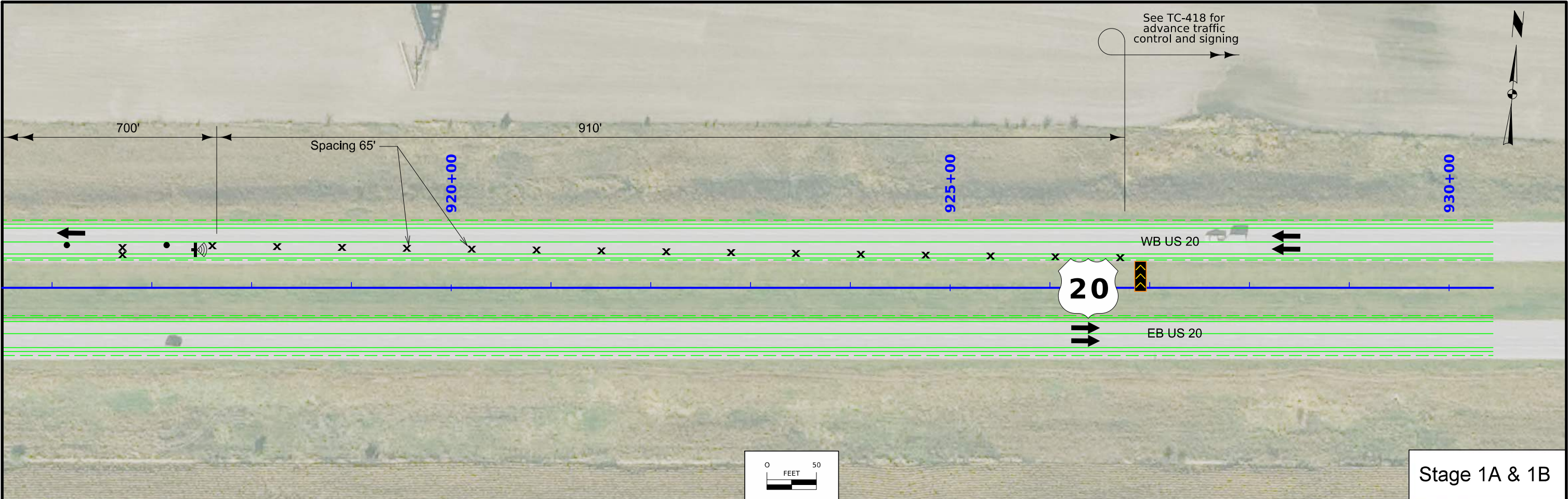
STAGE 2
(LOOKING AHEAD STATION)

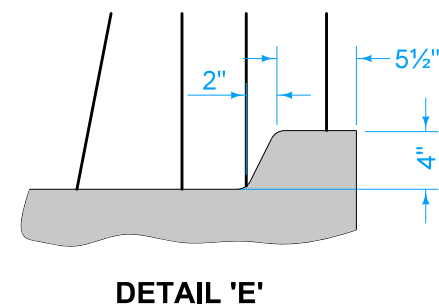
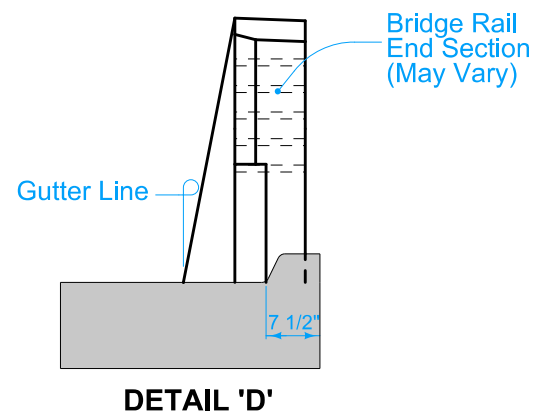
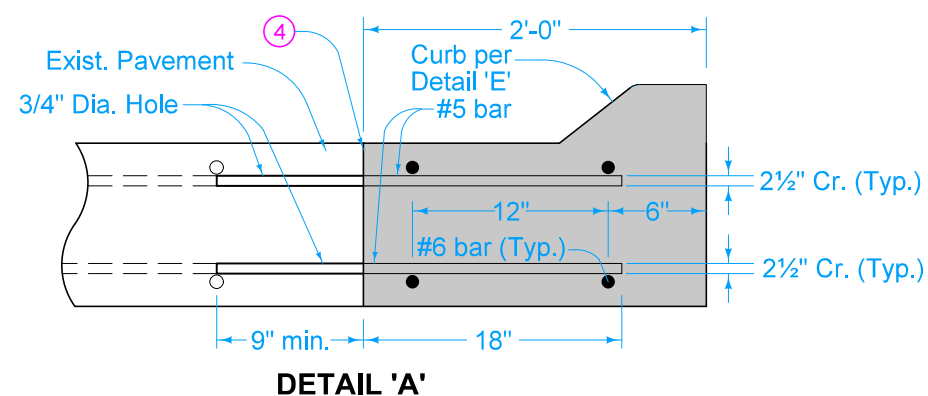
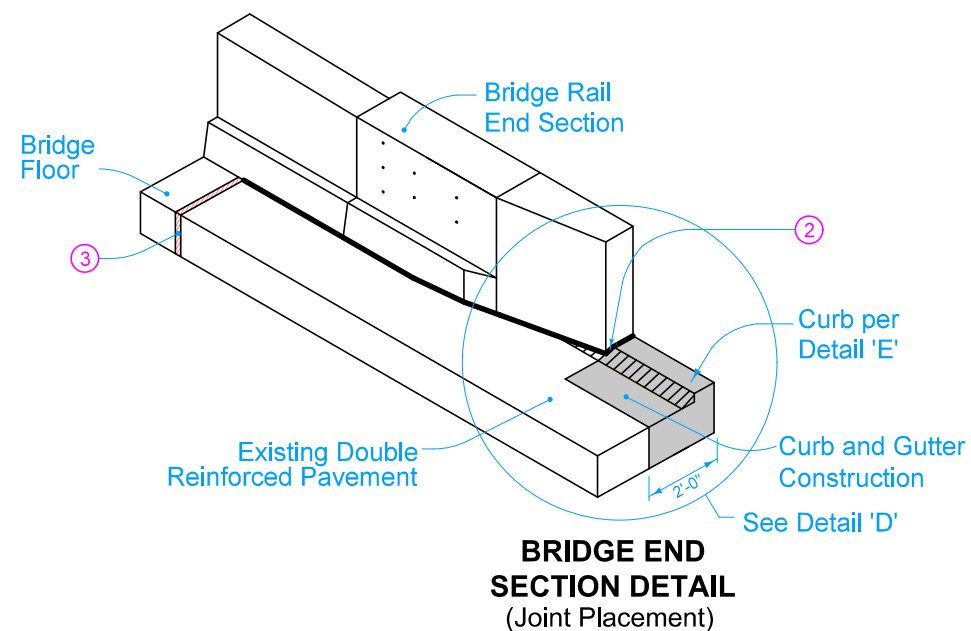
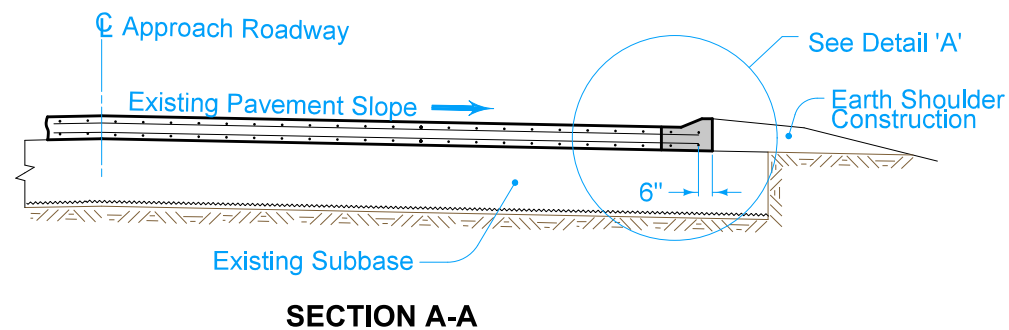
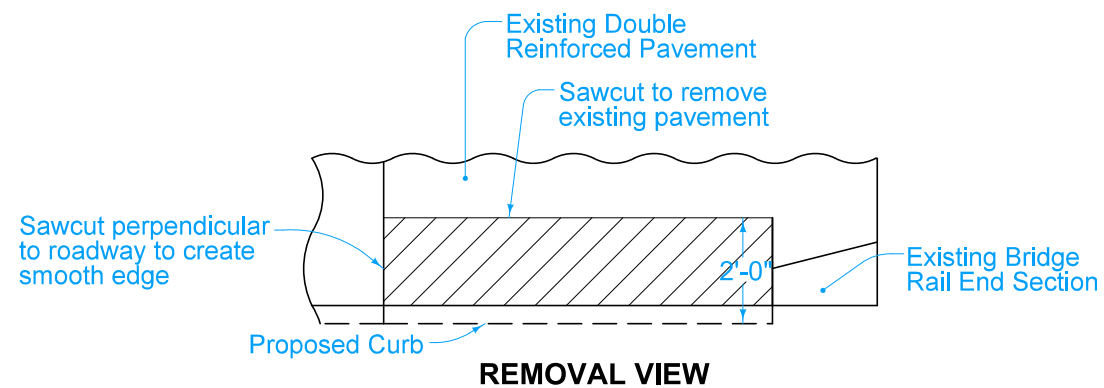
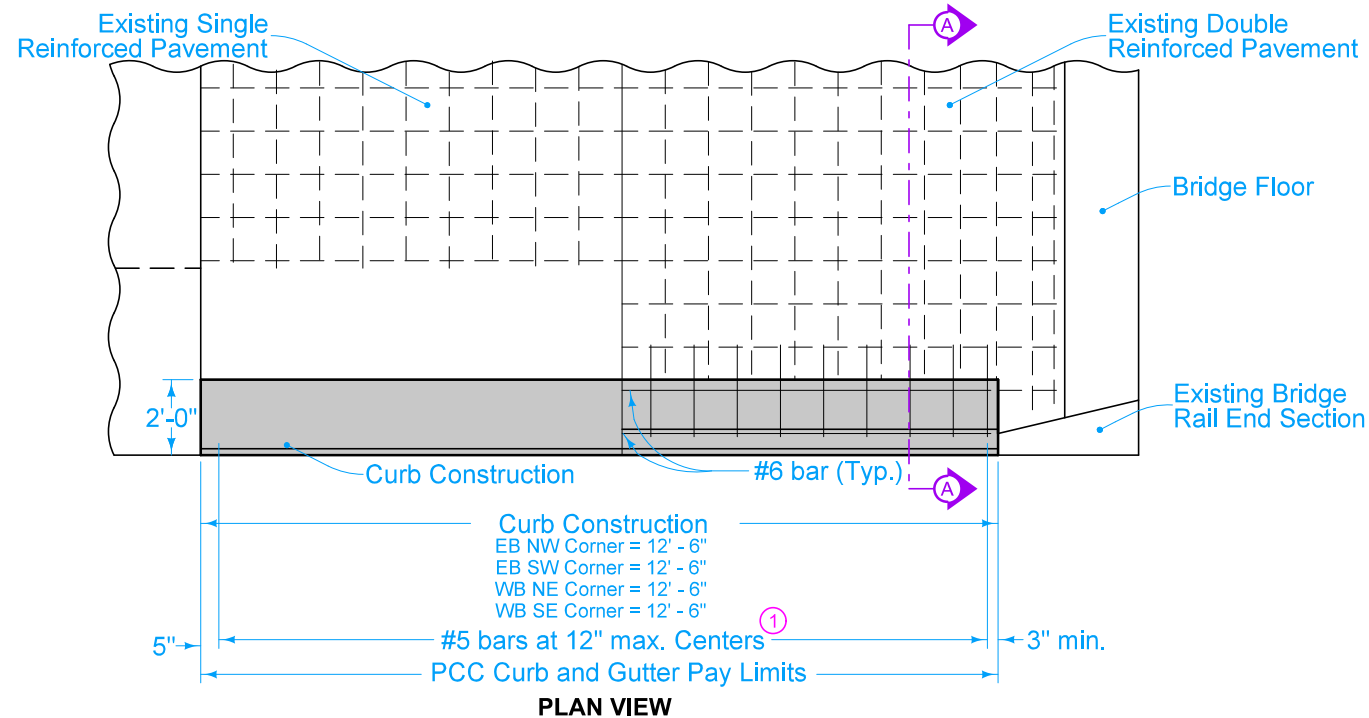
STAGING TYPICAL SECTIONS









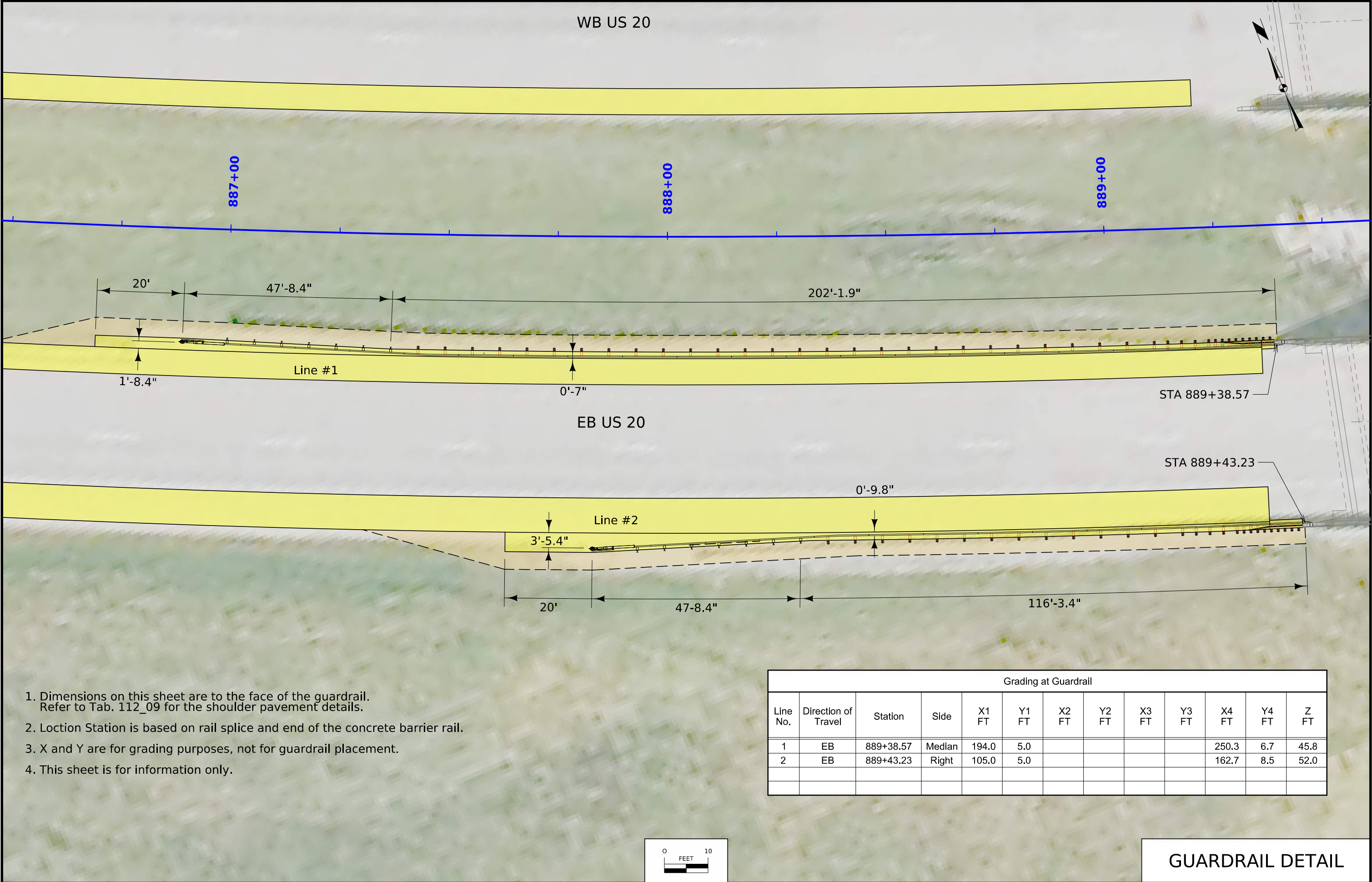


- ① Spacing of #5 bars may vary to avoid conflict with existing approach slab reinforcement.
- ② Expansion joint at end of Bridge Rail End Section: Place joint filler the full depth of the bridge approach pavement. In areas with curb, place full depth of pavement plus curb and shape material to fit the shape of the curb per Section B-B of PV-101. Seal joint per Detail F of PV-101.
- ③ Refer to Bridge Sheets for Bridge Joint details.
- ④ 'BT-4' Joint, refer to PV-101. Incidental to Curb and Gutter, As Per Plan.

Contract Item:
Curb and Gutter, P.C. Concrete, As Per Plan

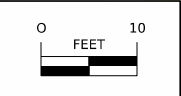
Tabulations:
112-4

CURB CONSTRUCTION DETAILS



- 1. Dimensions on this sheet are to the face of the guardrail. Refer to Tab. 112_09 for the shoulder pavement details.
- 2. Location Station is based on rail splice and end of the concrete barrier rail.
- 3. X and Y are for grading purposes, not for guardrail placement.
- 4. This sheet is for information only.

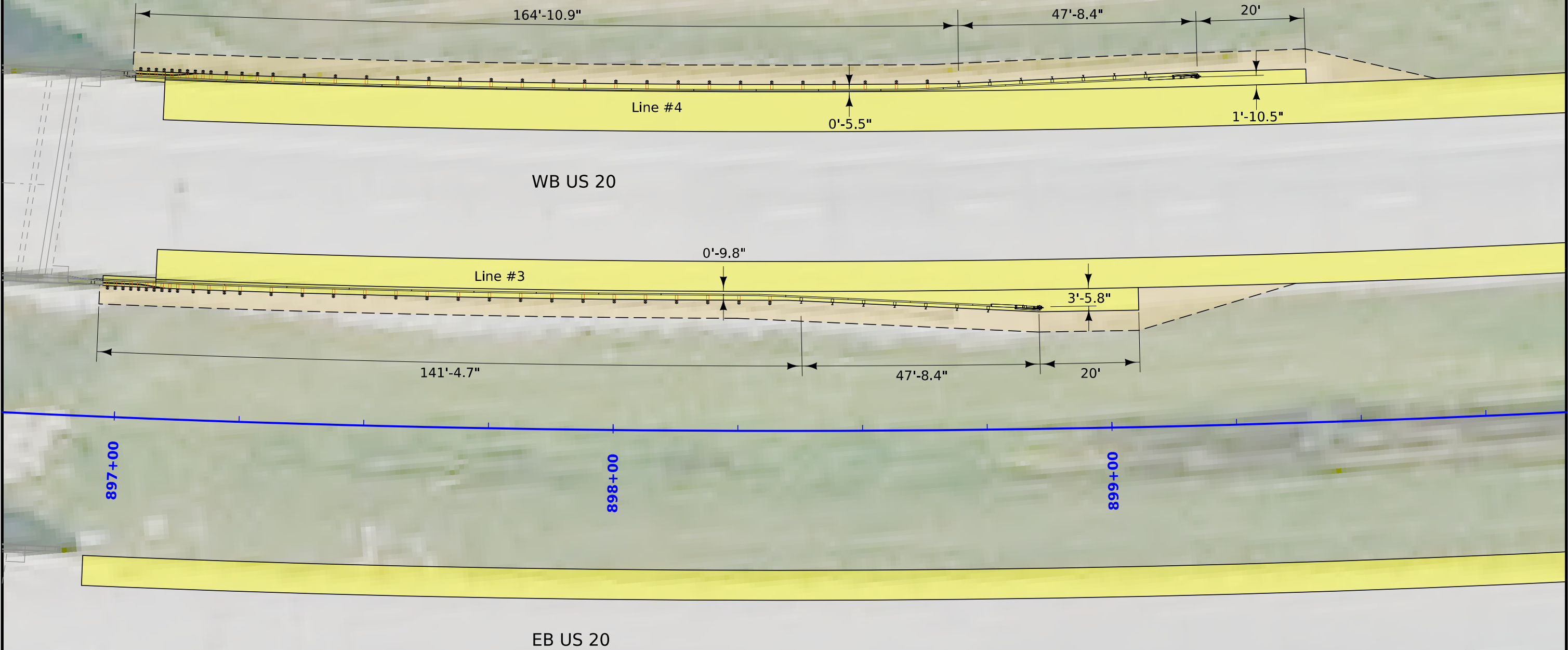
Grading at Guardrail												
Line No.	Direction of Travel	Station	Side	X1 FT	Y1 FT	X2 FT	Y2 FT	X3 FT	Y3 FT	X4 FT	Y4 FT	Z FT
1	EB	889+38.57	Median	194.0	5.0					250.3	6.7	45.8
2	EB	889+43.23	Right	105.0	5.0					162.7	8.5	52.0



GUARDRAIL DETAIL

- 1. Dimensions on this sheet are to the face of the guardrail.
Refer to Tab. 112_09 for the shoulder pavement details.
- 2. Location Station is based on rail splice and end of the concrete barrier rail.
- 3. X and Y are for grading purposes, not for guardrail placement.
- 4. This sheet is for information only.

Grading at Guardrail												
Line No.	Direction of Travel	Station	Side	X1 FT	Y1 FT	X2 FT	Y2 FT	X3 FT	Y3 FT	X4 FT	Y4 FT	Z FT
3	WB	896+95.96	Median	131.6	5.0					187.5	8.5	52.0
4	WB	897+00.91	Left	156.6	5.0					214.7	6.7	45.8



GUARDRAIL DETAIL