

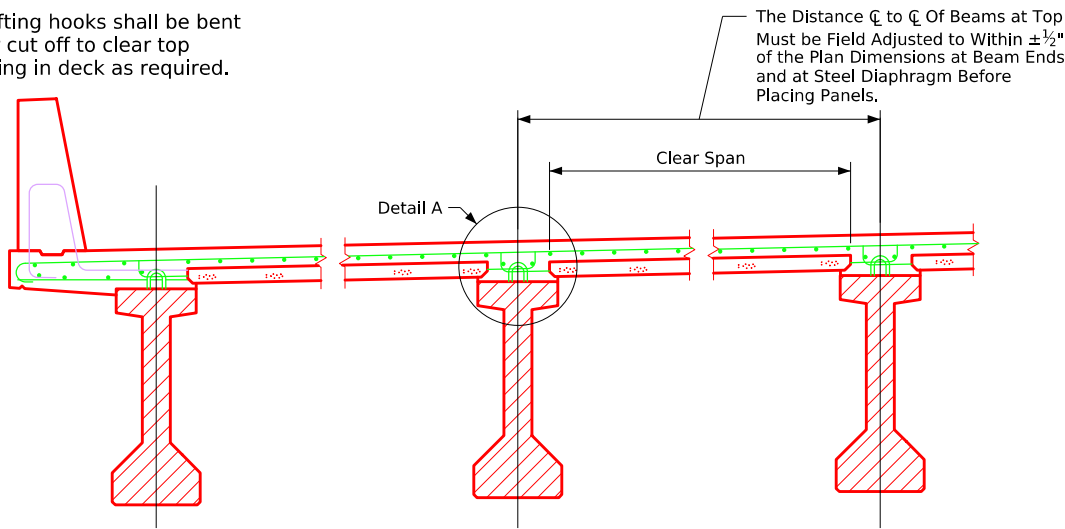
Revised 07-19: Changed Standards 1065 & 1066 Titles Referring to "Slab" to "Deck".
Revised 03-2022: Now void are Standard Sheets 1035, 1035A, 1035B, 1035C, 1035D, 1035E and 1069. Standard Sheets 1035, 1035A, 1035B, 1035C, 1035D, 1035E were removed from Index of Sheets.
Revised 06-2025: Added new Standard Sheet 1054A, Trench Deck Drain Details.
MiscellaneousBridges.dgn - 100-M - This Sheet Re-Issued 11-2023. Sheet Format Update. 1037As1 & 1037As2 was 1037 and 1037B. 1037C was 1037A. 1037Bs1 & 1037Bs2 newly issued.

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1037As2	'A' - 'D' Beam Precast Prestressed Concrete Deck Panel (2 of 2)
1037Bs1	'BT' Beam Precast Prestressed Concrete Deck Panel (1 of 2)
1037Bs2	'BT' Beam Precast Prestressed Concrete Deck Panel (2 of 2)
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Revised 06-2025: Updated Design Stresses Welded Wire Fabric fy=70ksi. (was ??), and added CIP Concrete information. Added Note to Designer regarding haunch depth at centerline. Updated "j" bars and "5c2" deck-to-barrier rail bars
In the "Typical Deck Section" & "Detail of Deck Overhang" details.
MiscellaneousBridges.dgn - 1037As1 - This Sheet Re-Issued 11-2023 (was 1037 and 1037B). Sheet Format Update.

Note: Lifting hooks shall be bent down or cut off to clear top reinforcing in deck as required.



Typical Deck Section

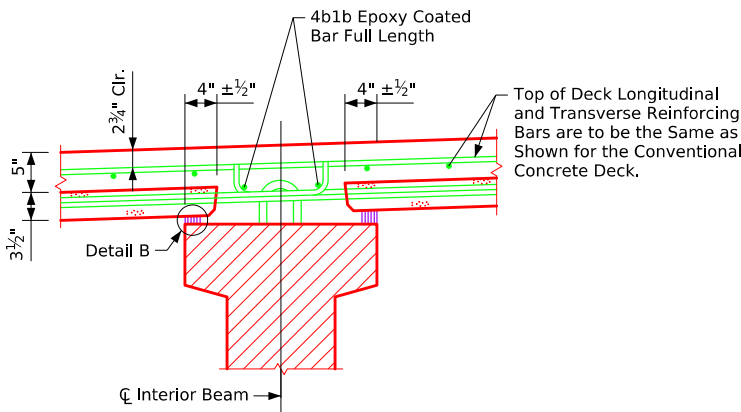
Note: Variation in haunch dimension is to be accomplished by varying the thickness of fiber board in order to secure a uniform deck thickness. A minimum cast-in-place deck thickness as shown in Detail A shall be maintained. The deck may be thickened when the maximum haunch shown is not sufficient to adjust the deck to a smooth profile, except no deck thickening will be allowed within the middle half of a span. Reinforcing bar clearances as shown on Detail A shall be strictly adhered to, which may require the use of variable height bar chairs. The fiber board shall be asphalt impregnated fiber board as per AASHTO M-213 or fiber board sheathing as per ASTM C208, impregnated with asphalt.

The Distance ϕ to ϕ Of Beams at Top Must be Field Adjusted to Within $\pm \frac{1}{2}$ " of the Plan Dimensions at Beam Ends and at Steel Diaphragm Before Placing Panels.

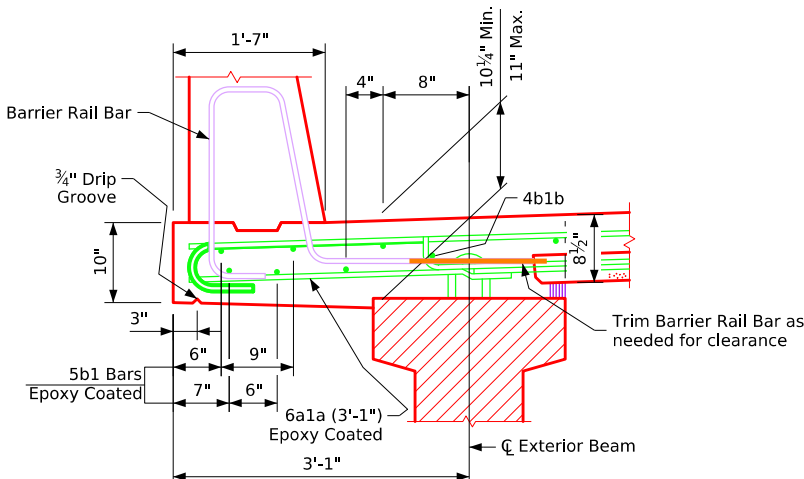
Smooth Trowel $1\frac{3}{4}$ " Each Edge, Finish Remainder as per Materials IM570

Typical Beam Detail

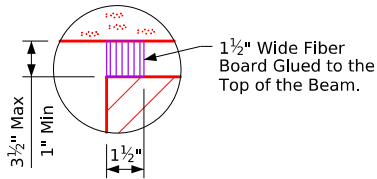
Note to Designer: If the haunch depth at the centerline of the beam flange exceeds the maximum design limits because of beam camber and grade considerations and the beam shear reinforcing does not meet the minimum embedment of 3.0 inches into the deck, the Designer shall provide additional haunch reinforcing (Option 1) or adjust the height of shear reinforcing (Option 2) as noted in the Bridge Design Manual, Haunches 5.3.2.1.



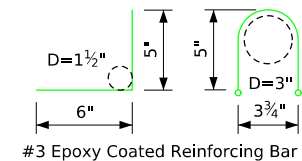
Detail A



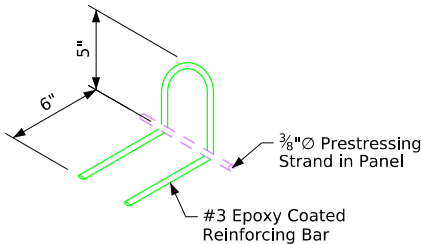
Detail of Deck Overhang



Detail B



Note: D = Pin Diameter.
Alternate lifting hook may be substituted with the approval of the Engineer.



Lifting Hook Detail

General Notes:

The stay-in-place deck panels are designed to support the dead load of the panel, plastic cast-in-place concrete and 50 lbs per square foot of construction load. The panel and cast-in-place deck, acting as a composite section is designed for HL-93 live load plus 20 lbs per square foot of roadway for future wearing surface.

Shop drawings showing layout and construction details of the deck panels shall be submitted for approval.

The maximum allowable dimensional tolerance for the deck panels shall be as follows:

- Thickness + $\frac{3}{16}$ " or -0"
- Length $\pm \frac{1}{4}$ "
- Width $\pm \frac{1}{8}$ "
- Square ends (deviation from square) $\pm \frac{3}{8}$ "

The top surface of the deck panels shall be given a suitable texture with a wire broom or comb having a single row of tines. The desired grooving is longitudinal grooving (parallel to the centerline of bridge roadway) which may vary from $\frac{1}{16}$ " width at $\frac{1}{2}$ " centers to $\frac{3}{16}$ " width at $\frac{3}{4}$ " centers, and the groove depth should be $\frac{1}{8}$ " to $\frac{3}{16}$ ".

Sandblasting the plank surface is not considered necessary, under normal conditions, but may be required to remove unusual surface laitance or other surface contaminants. Prior to concrete placement, the plank surface and beam top shall be blown free of dust and debris with an oil free air blast.

Prior to concrete placement, the plank surface and beam top shall be cleaned by water blasting. Special care must be taken to remove all debris from under the ends of the plank. The plank surface shall be wet and free of standing water when cast-in-place concrete is placed on the plank.

The prestressing strands shall be $\frac{3}{8}$ " ϕ Grade 270 ASTM A416 low-relaxation strands with an initial tension of 16,100 lbs per strand (70% of the guaranteed ultimate tensile strength.)

The welded deformed steel wire fabric shall be ASTM A1064. Epoxy coated #3 reinforcing bars spaced at 1'-0 centers in both directions shall be considered an allowable substitution for the WWF 6x6-D6 x D6. No additional payment will be provided.

The panel concrete shall have a minimum 28 day strength of 6.0 KSI and a minimum release strength of 4.5 KSI. Cast-in-place concrete shall have a minimum 28 day strength of 4.0 KSI.

The deck panels shall be at least 28 days old before the cast-in-place deck is placed or as approved by Engineer.

Concrete shall be placed in strips along beams before placement on the precast panels. Complete concrete coverage beneath precast panel ends is required for panel bearing support.

When deck panels are used in construction of bridge deck, the bottom mat of deck reinforcing bars between all beams will be replaced by concrete deck panels. The bottom longitudinal reinforcing bars in the deck overhang and the top mat of reinforcing bars for the deck are to remain the same as shown for the conventional full-depth cast-in-place deck. The 6a1a bottom transverse reinforcing bars in the deck overhang shall be used in lieu of the 6a1 bottom transverse reinforcing bars. 6a1a bars shall be spaced and oriented the same as 6a1 bars.

Additional epoxy coated longitudinal bars 4b1b will also be required for the full length of the bridge. The location and number of these bars is shown in Detail A and the deck overhang detail.

Basis of payment shall be for the cast-in-place deck shown in the plans. Quantity adjustments to concrete and reinforcing steel are provided for Contractor information only.

Specifications:

Design:
AASHTO LRFD Series of 2017

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.
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Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD, Series of 2017.

Reinforcing steel in accordance with Section 5, $f_y = 60$ ksi.

Prestressed Concrete in accordance with Section 5, $f'_c = 6.0$ ksi.

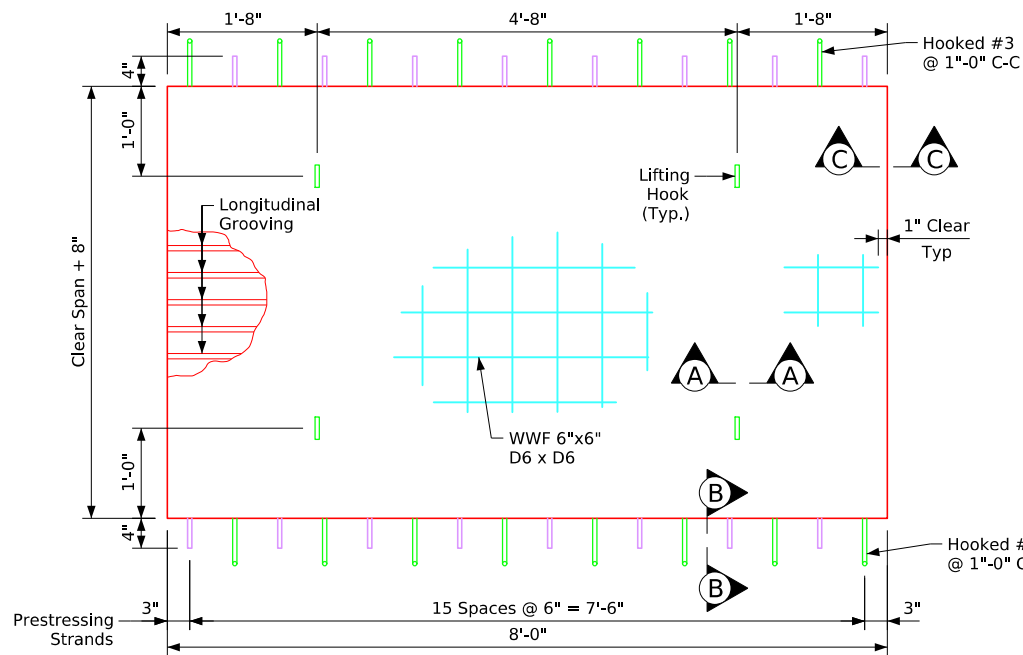
CIP Concrete in accordance with Section 5, $f'_c = 4.0$ ksi.

Prestressing Steel in accordance with Section 5, $f'_s = 270$ ksi.

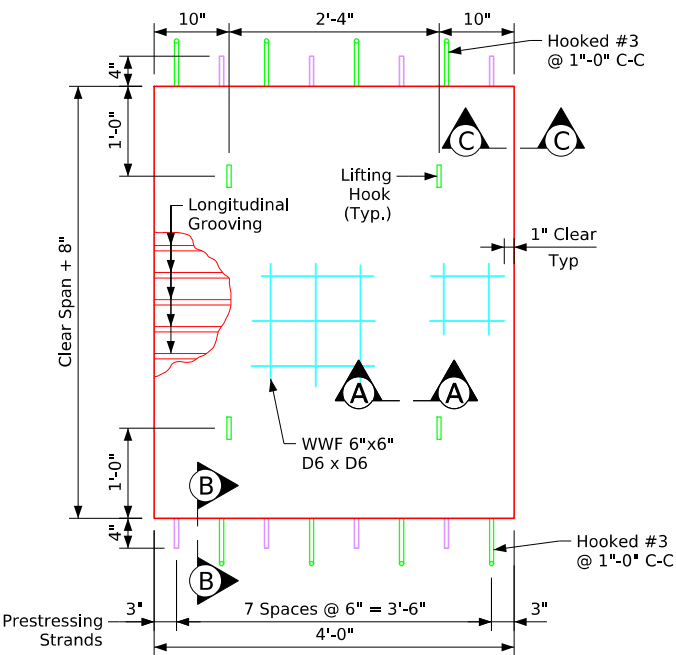
Welded Wire Fabric in accordance with Section 5, $f_y = 70$ ksi.

Precast Deck Panel Details

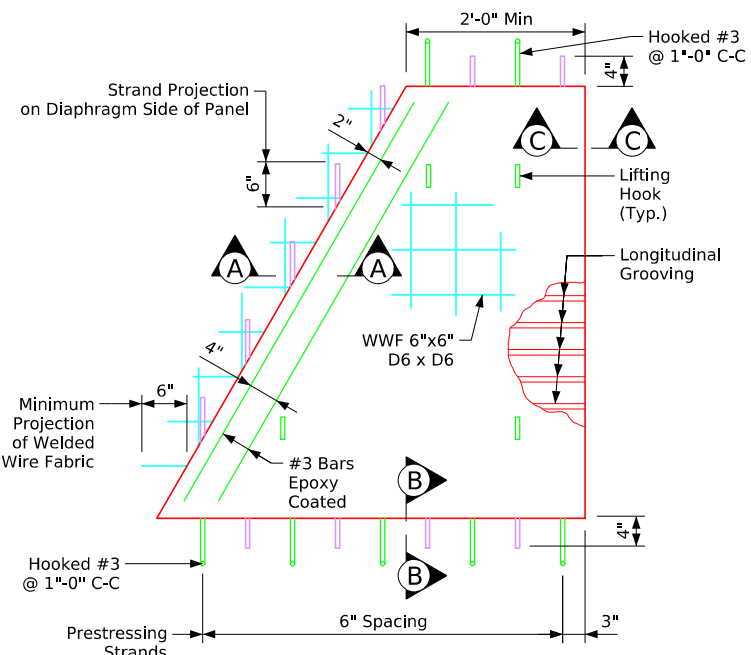
Revised 06-2025: Corrected Typos, Removed Lifting Loop Dimension on Skewed Deck Panels. Added Note for 0 (Zero) Degree Skews.
MiscellaneousBridges.dgn - 1037as2 - This Sheet Re-issued 11-2023 (was 1037 and 1037B). Sheet Format Update.



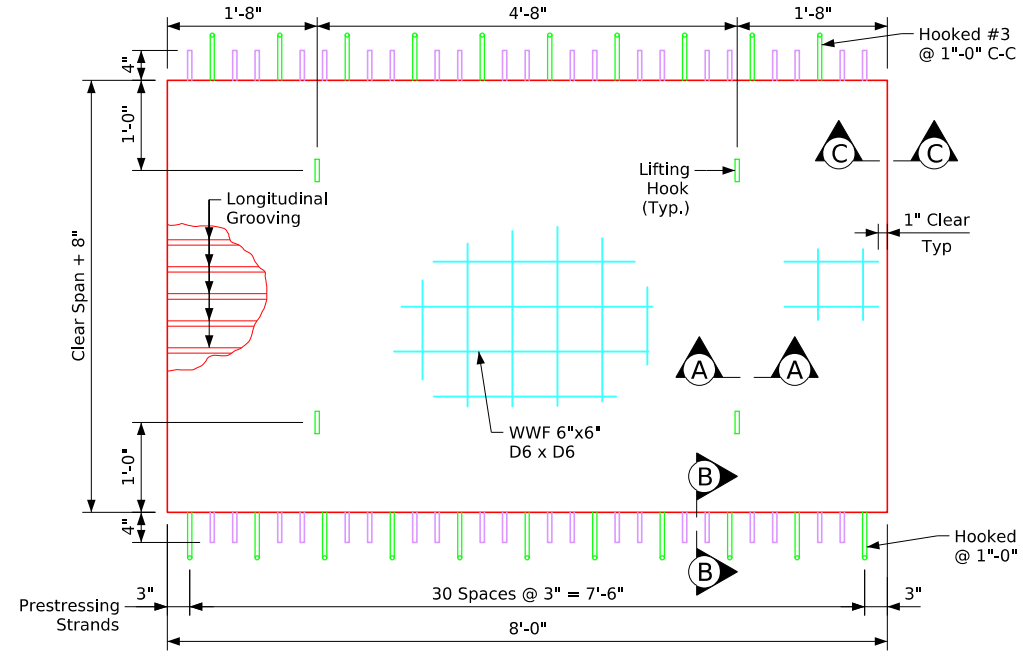
8'-0" Deck Panel
Maximum Clear Span = 7'-0"



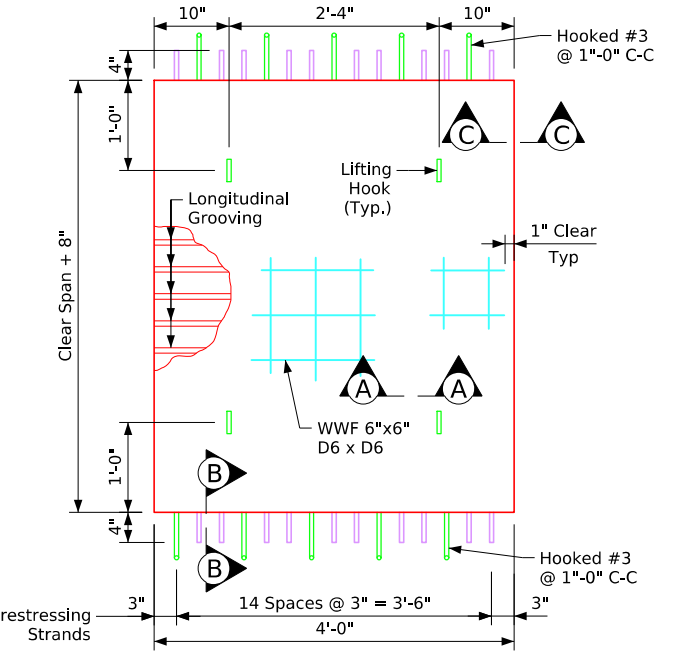
4'-0" Deck Panel
Maximum Clear Span = 7'-0"



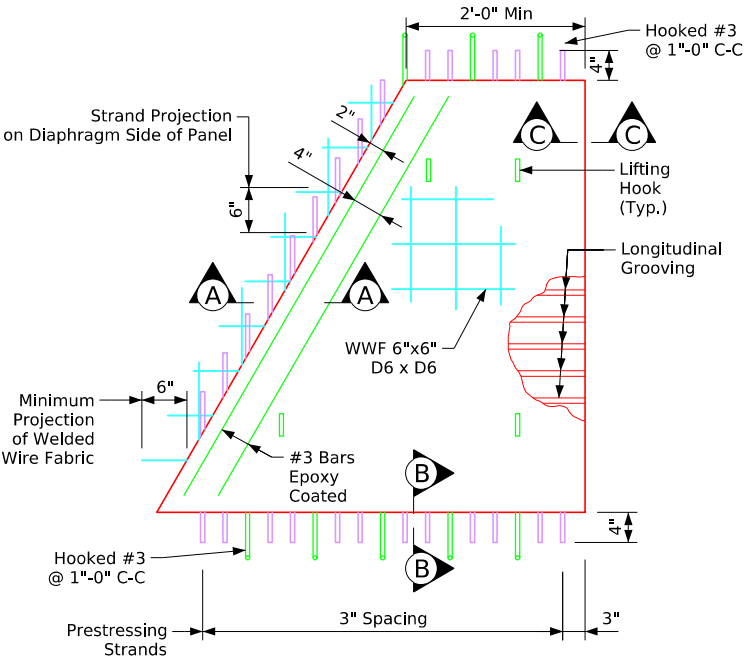
End Skew Deck Panel
Maximum Clear Span = 7'-0"



8'-0" Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"

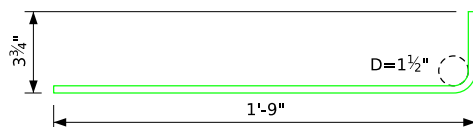


4'-0" Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"

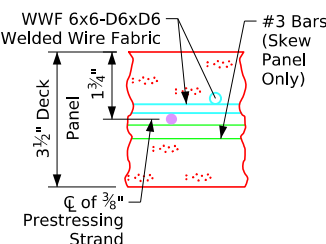


End Skew Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"

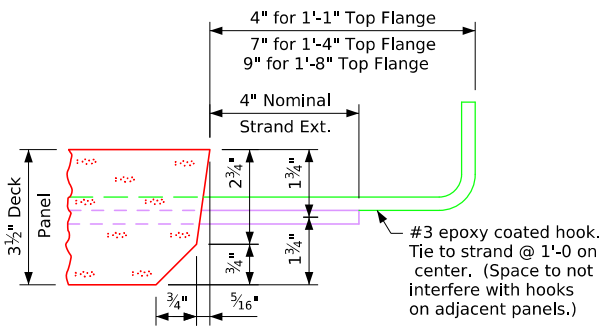
Note: For 0 (zero) degree skews, no minimum projection of welded wire fabric over diaphragms are required; maintain 1" clear distance from all panel edges to welded wire fabric.



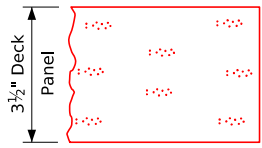
Hooked #3



Part Section A-A



Part Section B-B

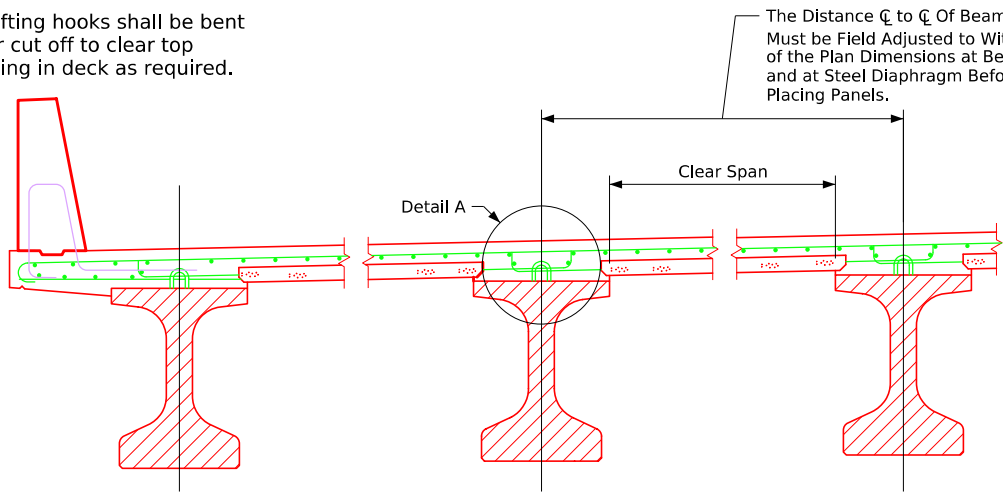


Part Section C-C

Precast Deck Panel Details

Revised 06-2025: Updated Design Stresses Welded Wire Fabric fy=70ksi. (was ??), and added CIP Concrete information. Added Note to Designer regarding haunch depth at centerline. Updated 11-2023. In the "Typical Deck Section" & "Detail of Deck Overhang" details. MiscellaneousBridges.dgn - 1037Bs1 - This Sheet Issued 11-2023.

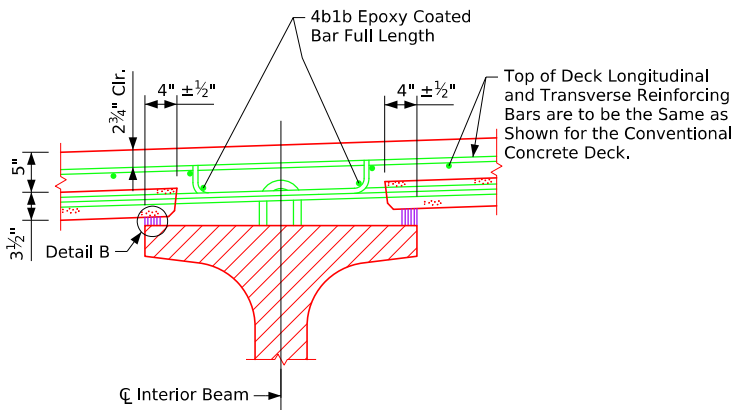
Note: Lifting hooks shall be bent down or cut off to clear top reinforcing in deck as required.



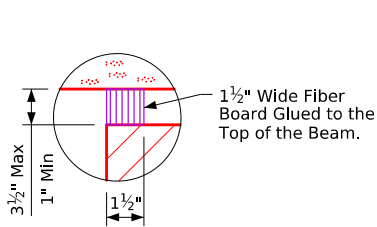
Typical Deck Section

Note: Variation in haunch dimension is to be accomplished by varying the thickness of fiber board in order to secure a uniform deck thickness. A minimum cast-in-place deck thickness as shown in Detail A shall be maintained. The deck may be thickened when the maximum haunch shown is not sufficient to adjust the deck to a smooth profile, except no deck thickening will be allowed within the middle half of a span. Reinforcing bar clearances as shown on Detail A shall be strictly adhered to, which may require the use of variable height bar chairs. The fiber board shall be asphalt impregnated fiber board as per AASHTO M-213 or fiber board sheathing as per ASTM C208, impregnated with asphalt.

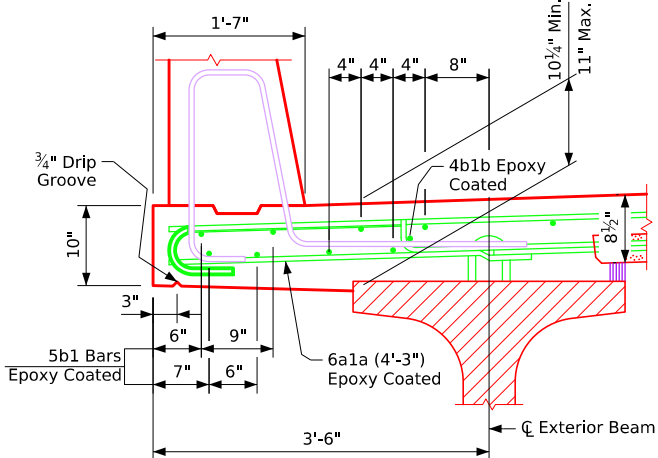
Note to Designer: If the haunch depth at the centerline of the beam flange exceeds the maximum design limits because of beam camber and grade considerations and the beam shear reinforcing does not meet the minimum embedment of 3.0 inches into the deck, the Designer shall provide additional haunch reinforcing (Option 1) or adjust the height of shear reinforcing (Option 2) as noted in the Bridge Design Manual, Haunches 5.3.2.1.



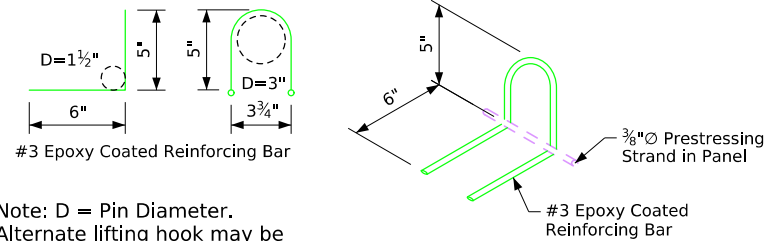
Detail A



Detail B



Detail of Deck Overhang



Note: D = Pin Diameter. Alternate lifting hook may be substituted with the approval of the Engineer.

Lifting Hook Detail

General Notes:

The stay-in-place deck panels are designed to support the dead load of the panel, plastic cast-in-place concrete and 50 lbs per square foot of construction load. The panel and cast-in-place deck, acting as a composite section is designed for HL-93 live load plus 20 lbs per square foot of roadway for future wearing surface.

Shop drawings showing layout and construction details of the deck panels shall be submitted for approval.

The maximum allowable dimensional tolerance for the deck panels shall be as follows:

- Thickness + 3/16" or -0"
- Length ± 1/4"
- Width ± 1/8"
- Square ends (deviation from square) ± 3/8"

The top surface of the deck panels shall be given a suitable texture with a wire broom or comb having a single row of tines. The desired grooving is longitudinal grooving (parallel to the centerline of bridge roadway) which may vary from 1/16" width at 1/2" centers to 3/16" width at 3/4" centers, and the groove depth should be 1/8" to 3/16".

Sandblasting the plank surface is not considered necessary, under normal conditions, but may be required to remove unusual surface laitance or other surface contaminants. Prior to concrete placement, the plank surface and beam top shall be blown free of dust and debris with an oil free air blast.

Prior to concrete placement, the plank surface and beam top shall be cleaned by water blasting. Special care must be taken to remove all debris from under the ends of the plank. The plank surface shall be wet and free of standing water when cast-in-place concrete is placed on the plank.

The prestressing strands shall be 3/8"Ø Grade 270 ASTM A416 low-relaxation strands with an initial tension of 16,100 lbs per strand (70% of the guaranteed ultimate tensile strength.)

The welded deformed steel wire fabric shall be ASTM A1064. Epoxy coated #3 reinforcing bars spaced at 1'-0 centers in both directions shall be considered an allowable substitution for the WWF 6x6-D6 x D6. No additional payment will be provided.

The panel concrete shall have a minimum 28 day strength of 6.0 KSI and a minimum release strength of 4.5 KSI. Cast-in-place concrete shall have a minimum 28 day strength of 4.0 KSI.

The deck panels shall be at least 28 days old before the cast-in-place deck is placed or as approved by Engineer.

Concrete shall be placed in strips along beams before placement on the precast panels. Complete concrete coverage beneath precast panel ends is required for panel bearing support.

When deck panels are used in construction of bridge deck, the bottom mat of deck reinforcing bars between all beams will be replaced by concrete deck panels. The bottom longitudinal reinforcing bars in the deck overhang and the top mat of reinforcing bars for the deck are to remain the same as shown for the conventional full-depth cast-in-place deck. The 6a1a bottom transverse reinforcing bars in the deck overhang shall be used in lieu of the 6a1 bottom transverse reinforcing bars. 6a1a bars shall be spaced and oriented the same as 6a1 bars.

Additional epoxy coated longitudinal bars 4b1b will also be required for the full length of the bridge. The location and number of these bars is shown in Detail A and the deck overhang detail.

Basis of payment shall be for the cast-in-place deck shown in the plans. Quantity adjustments to concrete and reinforcing steel are provided for Contractor information only.

Specifications:

Design:
AASHTO LRFD Series of 2017

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.
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Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD, Series of 2017.

Prestressed Reinforcing steel in accordance with Section 5, fy = 60ksi.

Concrete in accordance with Section 5, f'c = 6.0 ksi.

CIP Concrete in accordance with Section 5, f'c = 4.0 ksi.

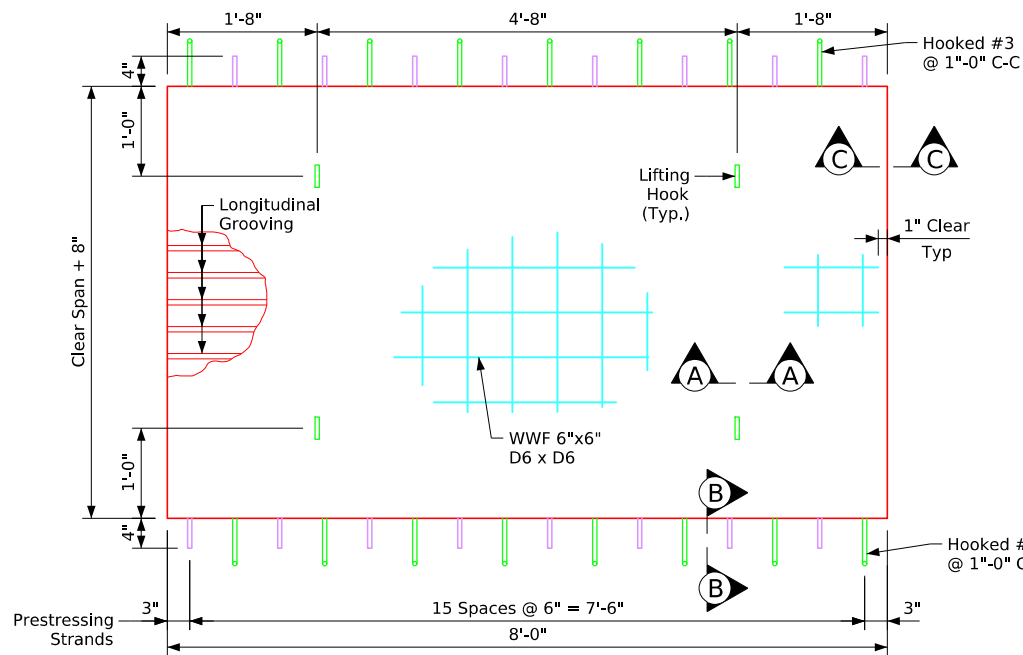
Prestressing Steel in accordance with Section 5, f's = 270 ksi.

Welded Wire Fabric in accordance with Section 5, fy = 70 ksi.

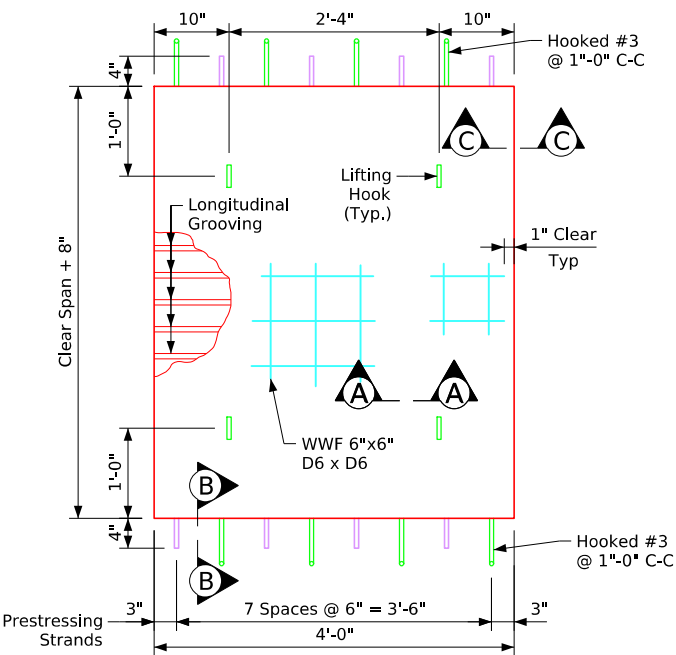
Precast Deck Panel Details

FILE NO.	ENGLISH	DESIGN TEAM	'BT' Beam Precast Prestressed Concrete Deck Panel (1 OF 2)	Standard Sheet 1037Bs1	COUNTY	PROJECT NUMBER	SHEET NUMBER
11:03:31 AM	6/13/2025	bkloss	pw:\NTPwint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\MiscellaneousBridges.dgn				

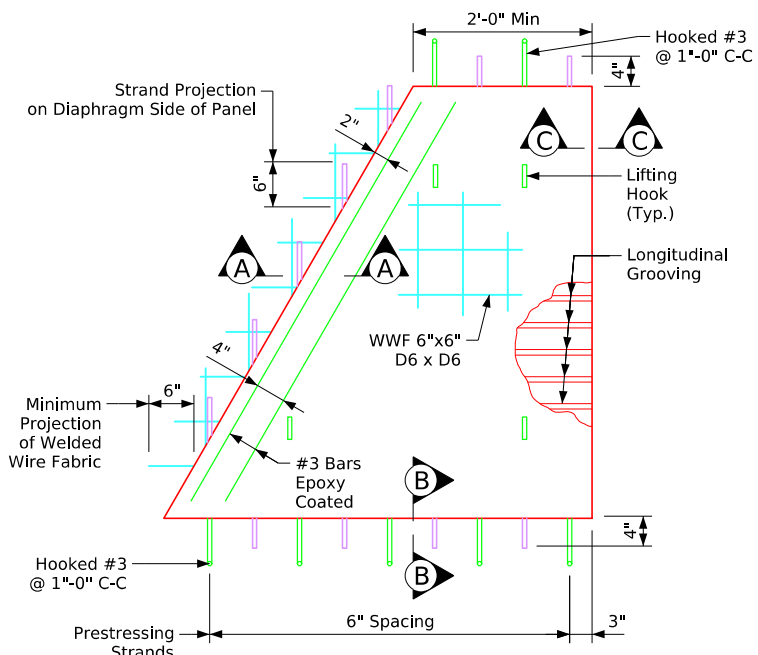
Revised 06-2025: Corrected Typos, Removed Lifting Loop Dimension on Skewed Deck Panels, Added Note for 0 (Zero) Degree Skews.
MiscellaneousBridges.dgn - 1037Bs2 - This Sheet Issued 11-2023.



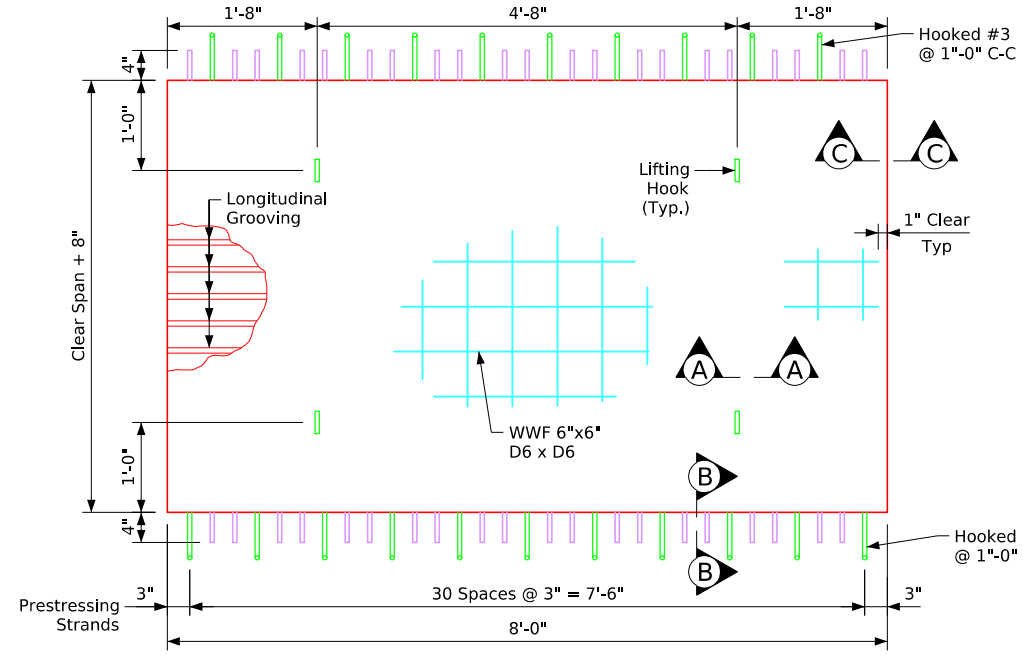
8'-0" Deck Panel
Maximum Clear Span = 7'-0"



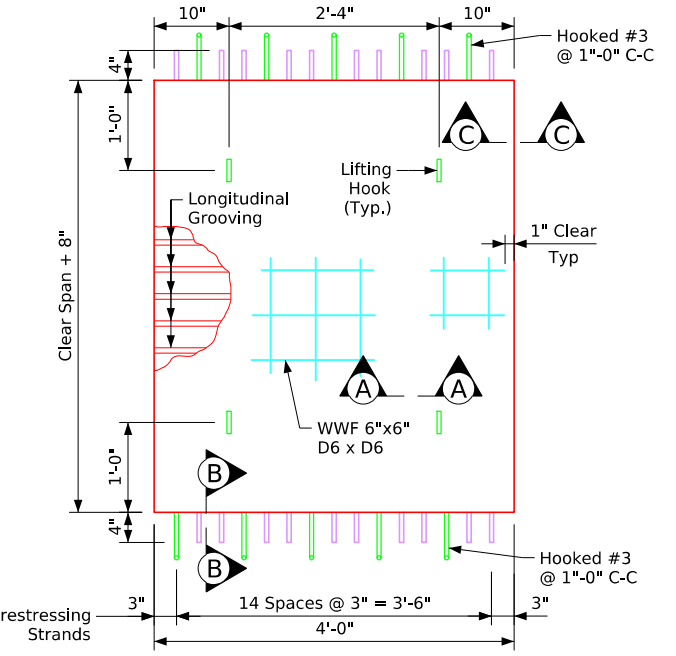
4'-0" Deck Panel
Maximum Clear Span = 7'-0"



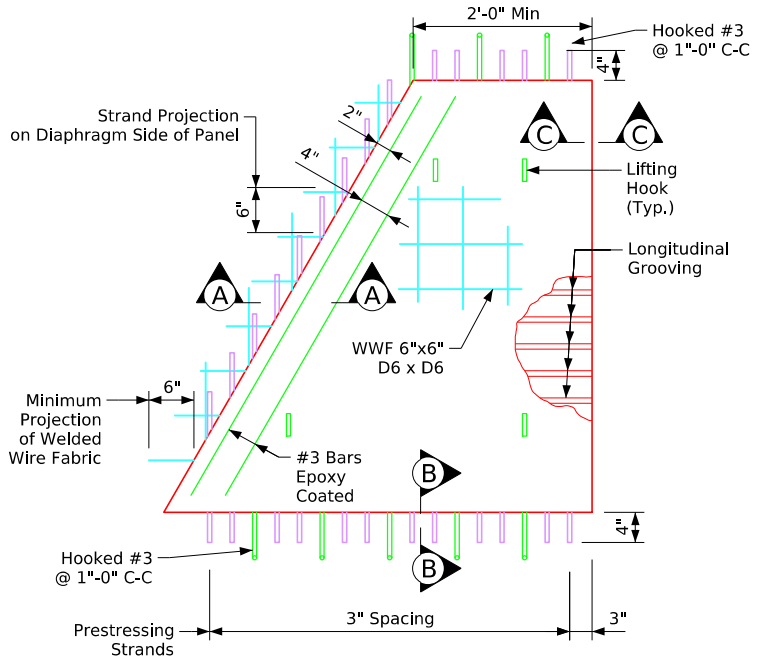
End Skew Deck Panel
Maximum Clear Span = 7'-0"



8'-0" Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"

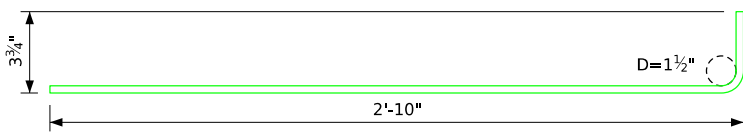


4'-0" Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"

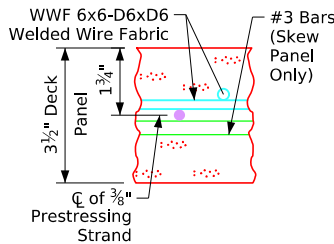


End Skew Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"

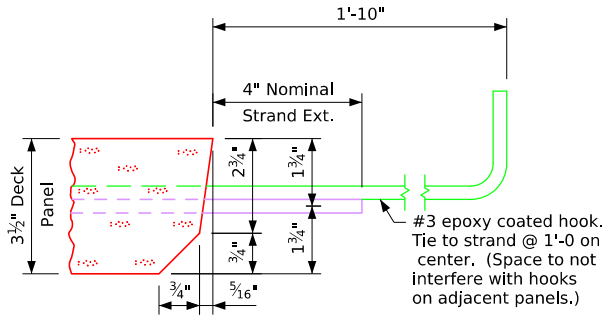
Note: For 0 (zero) degree skews, no minimum projection of welded wire fabric over diaphragms are required; maintain 1" clear distance from all panel edges to welded wire fabric.



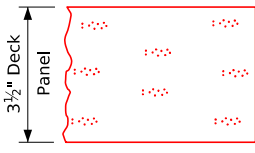
Hooked #3



Part Section A-A



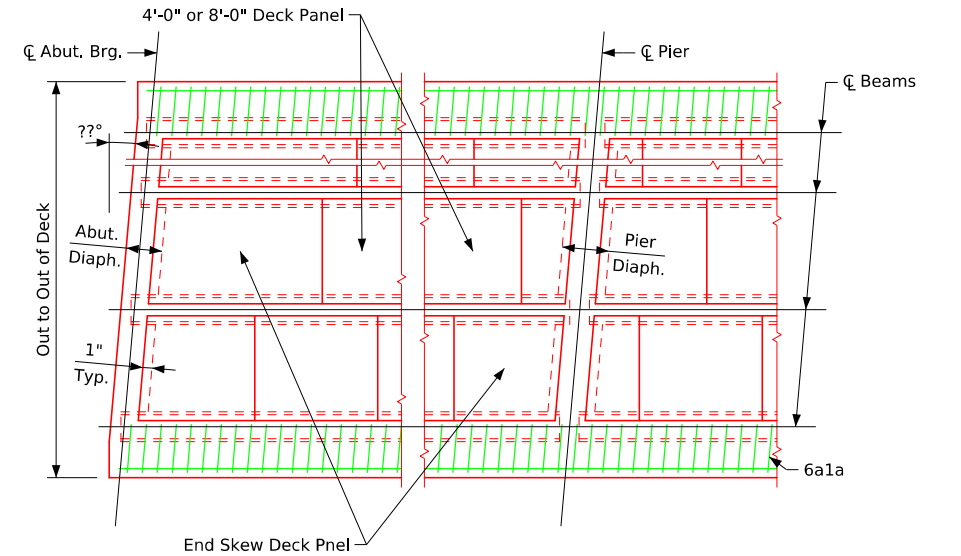
Part Section B-B



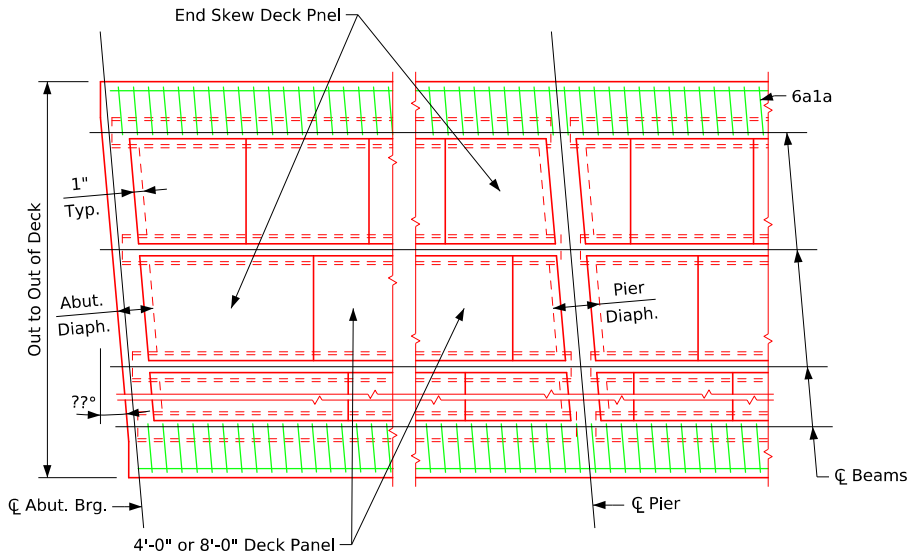
Part Section C-C

Precast Deck Panel Details

Revised 06-2024: Removed Modified Stirrup 4b1 or 5b1. 6b3 Details showing increased bar length when precast deck panels are used. This increase length was unnecessary. MiscellaneousBridges.dgn - 1037As1 - This Sheet Re-Issued 11-2023 (was 1037A). Sheet Format Update.

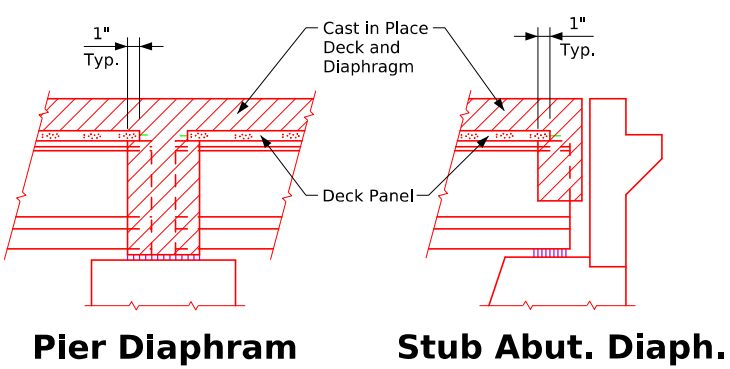


Deck Panel Location Part Plan
(For L.A. Skews 0° to 7°30')



Deck Panel Location Part Plan
(For L.A. Skews 0° to 7°30')

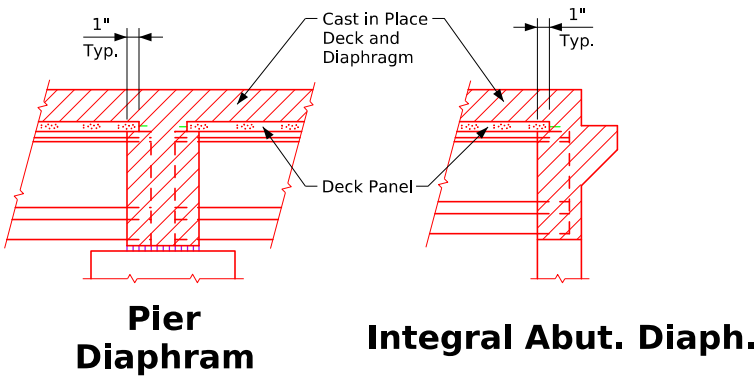
Note: Areas outside of panel sections are full depth cast-in-place deck and diaphragms. Alternate detail of using full depth cast-in-place deck at the skewed ends may be submitted for approval.



Note to Designer: Put on
Superstructure Bar List Sheet.

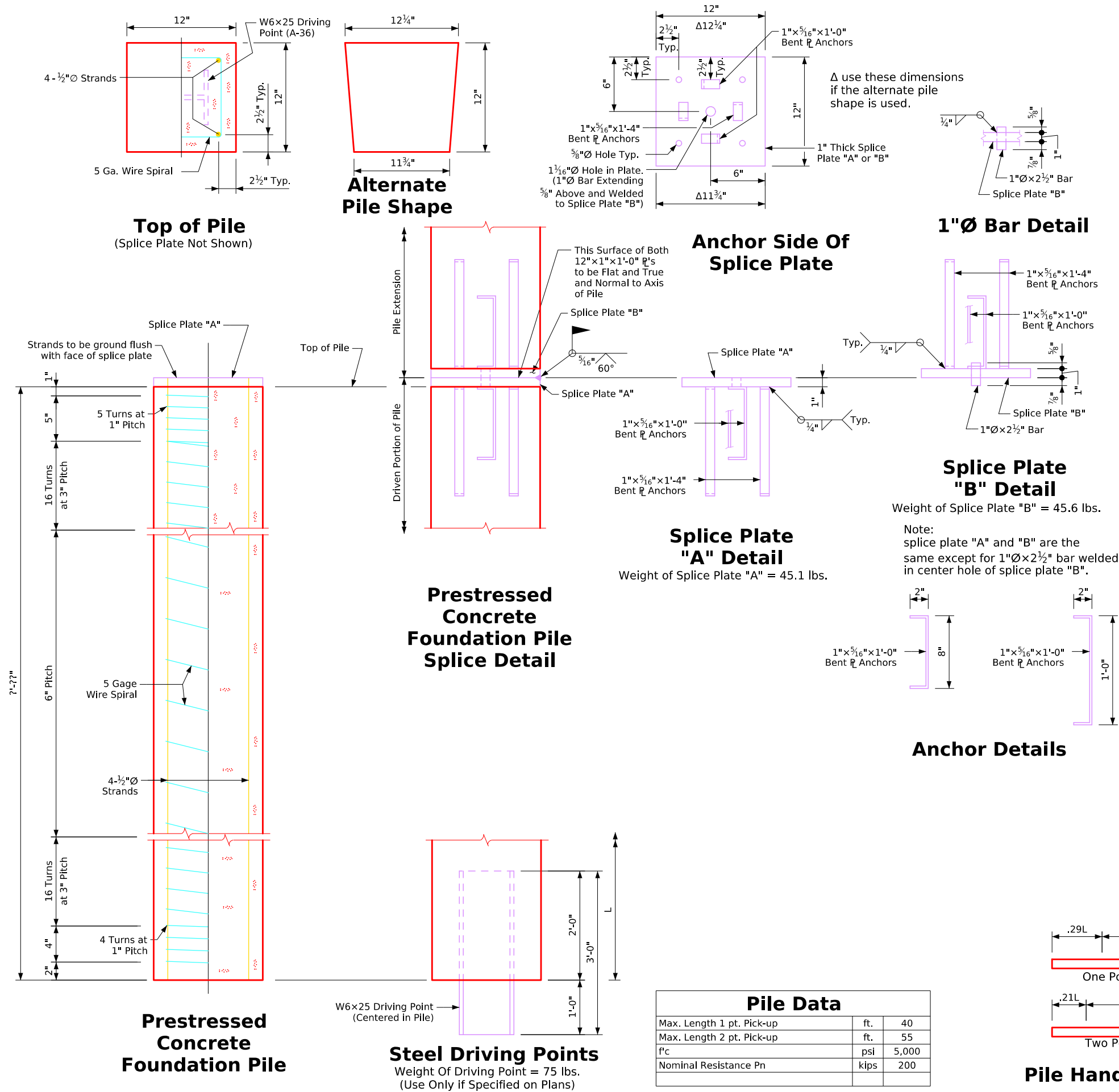
Note: If the precast prestressed concrete deck panels are to be used in the construction of the bridge deck in lieu of the conventional cast-in-place deck, the following adjustments to the Superstructure Epoxy Coated Reinforcing Steel shall be made.

Adjustments to Epoxy Coated Reinforcing Steel						
Delete	Bar	Location	Shape	No.	Length	Weight
	6a1	Deck Transv. Bott.				
	5b1	Deck Longit. Bott.				
Add	6a1a	Deck Overhangs Transv. Bott.				
	4b1b	Deck Longit. Bott.				
Reinforcing Steel Epoxy Coated - Reduction (lbs)						



Precast Deck Panel Details

Revised 10-2021: Updated spiral requirements to ASTM A1054 Grade 70 (WAS ASTM A82).
MiscellaneousBridges.dgn - 1046 - This Sheet Re-Issued 11-2023. Sheet Format Update.



General Notes:

The 12" prestressed concrete foundation pile shall be used in pier footings and stub abutment footings only.

Except as noted elsewhere, material, construction, driving, and extensions shall be in accordance with Standard Specifications of the Iowa D.O.T. and current Supplemental Specifications and Special Provisions when applicable.

Bearing value shown is for friction type bearing. Bearing value shall be as specified on the plans.

Driving point, if called for on the plans, shall be as detailed. Cost of all driving points is to be included in the price bid per lineal foot for piling.

The splicing of the piles shall be in accordance with Article 2501.03, P, of the Standard Specifications.

All piles, except pile extensions if required, shall have splice plate "A" installed on top end of pile to facilitate splicing of piles as necessary.

Heads of prestressed piles shall be normal to axis of pile.

All prestressing strands are to be ½"Ø 270k Grade. The total initial prestressing force is to be 118 kips for normal curing or 122 kips for artificial curing.

Wire spiral shall conform to ASTM A1064 Grade 70.

Pile Splice Notes:

All piles are required to have a pile splice plate "A" installed in the upper end of the pile to facilitate pile extension in the event the plan length piles are not adequate. Pile splicers shall be as detailed on this sheet.

The maximum length (L) of an individual section of pile shall be 55 feet. When piles longer than 55 feet are required on the plans, pile splicers shall be used to fasten pile sections together to provide the required plan length. One pile splice only will be allowed in the plan length of piles 56 to 110 feet. Pile sections shall be welded together at splices after first section of pile is driven.

Cost of structural steel required for splice plates shall be considered incidental to price bid for Prestressed Concrete Piling - 12 inch.

Specifications:

Design: AASHTO LRFD 7th Edition, Series of 2014.

Construction: Iowa Department of Transportation Standard Specifications, current series, plus current Supplemental Specifications and Special Provisions.

Design Stresses:

Design stresses for the following materials are in accordance with The AASHTO LRFD Bridge Design Specifications 7th Edition, Series of 2014.

Concrete in accordance with Section 5, f'c = 5,000 psi.

Prestressing steel in accordance with AASHTO LRFD Section 5, f's = 270,000 psi.

Structural steel in accordance with AASHTO LRFD Section 6. ASTM A709 Grade 36.

Note:

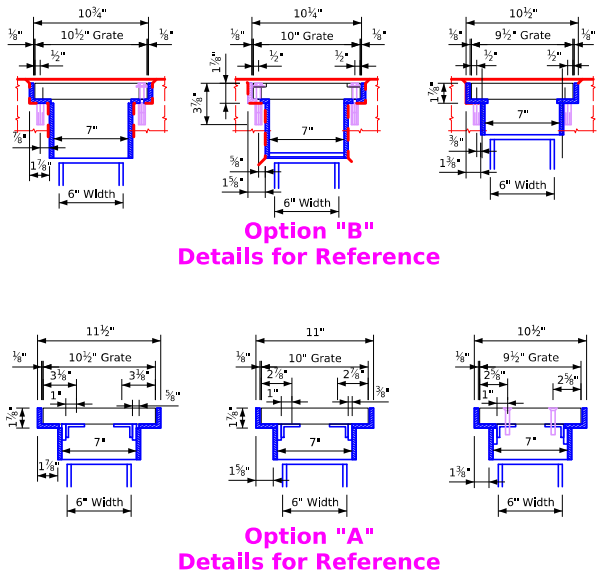
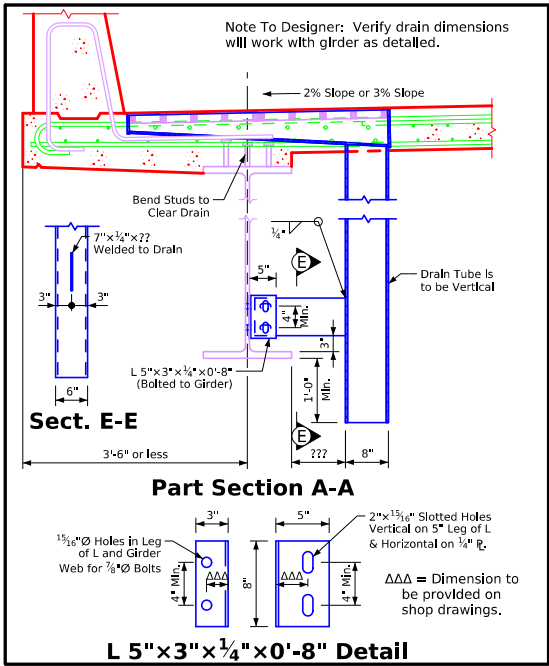
The top portions of the prestressed concrete foundation piles that are to be encased in concrete shall be roughened, after piles have been driven, by sandblasting or other approved methods to provide suitable bond between the pile and footing in accordance with Article 2403.03, I, of the Standard Specifications. Cost of this work is to be included in the price bid for Prestressed Concrete Piling - 12 inch.

12" Prestressed Concrete Foundation Pile Material Components

Item	Unit	L=40'	One Foot Increment
Concrete	c.y.	1.48	0.037
5 Gage Wire Spiral	lb.	32	0.62
Prestressing Steel	lb.	84	2.08

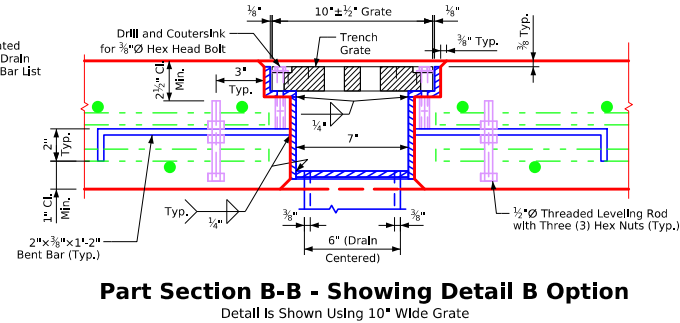
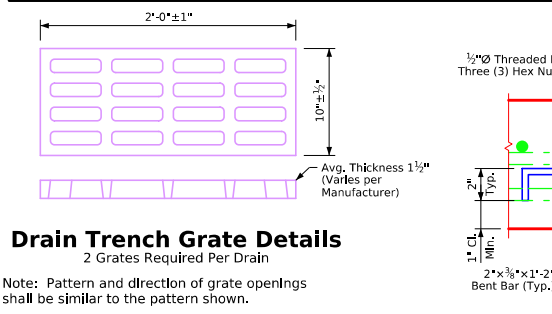
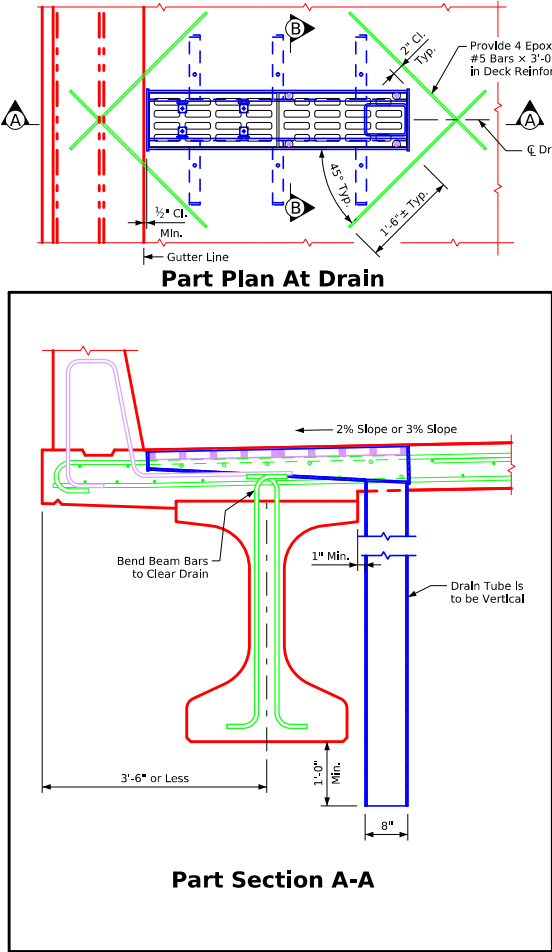
Approved By: 
Bridge Engineer

12" Prestr. Conc. Foundation Piles



Redrawn 11-00.
Revised 09-03: Minor Dimensions and Plate Sizes Changed. Added Hex Head Screw Detail. Additional Beam Shapes Outside of Sheet.
Revised 11-06: Corrected Drain Tube Thickness to 1/8" Thickness. Moved to M-03. Changed Drain Pipe to Round Tube with Square Tube Option. Gate Hold Down Bolts Changed to 3/8" size.
Revised 09-12: The Drain Extension Below the Girders Extended to a 1'-0" Distance.
Revised 07-13: The Stainless Steel 3/4" Cap Screws and Hex Head Bolt were Changed to Mechanically Galvanized.
Revised 10-16: Added 1/2" Filler Weld Callout to Drain Tube In "Part Section A-A" Steel Beam Detail.
Revised 06-17: Sheet is Redrawn to Accommodate the Use of a 6"x8"x3/4" Drain Tube. (Was 8" Dia. x 3/4". Structural Drain Tube may be Substituted with a 6"x8"x3/4" Structural Tube.)
Revised 04-18: Moved Dimension Text to 8'-0" Deck Panel Detail. It was Overlapped by Dimension Line.
Revised 07-19: Updated Weld Symbols on Drain Trench Details in "Part Section B-B & C-C" and "Plan View of Drain Trench".
Added "ΔΔΔ = Dimension to be Provided on Shop Drawings" to Down Spout Bracket on Steel Girder Detail. Changed all References of "Slab" to "Deck".

Revised 06-2025: Updated barrier rail rebar shape as well as cadd levels used on details and corrected typos.
MiscellaneousBridges.dgn - 1054 - This Sheet RedIssued 11-2023. Sheet format update.



Drain Notes

The drains shall be 3/8" thick steel. The drain assemblies shall be galvanized after fabrication. The bid item "Deck Drain" shall include all costs associated with fabricating and installing the deck drains as per plan.

The drain trench grates shall be ferrous castings. Metal used in the manufacture of castings shall conform to ASTM A48-83 Class 35B or better gray iron castings in accordance with current Iowa D.O.T. Standard Specifications. Finish of castings shall be smooth and free of defects. Trench grates shall be capable of carrying AASHTO HL-93 loading. Galvanizing of the trench grates is not required.

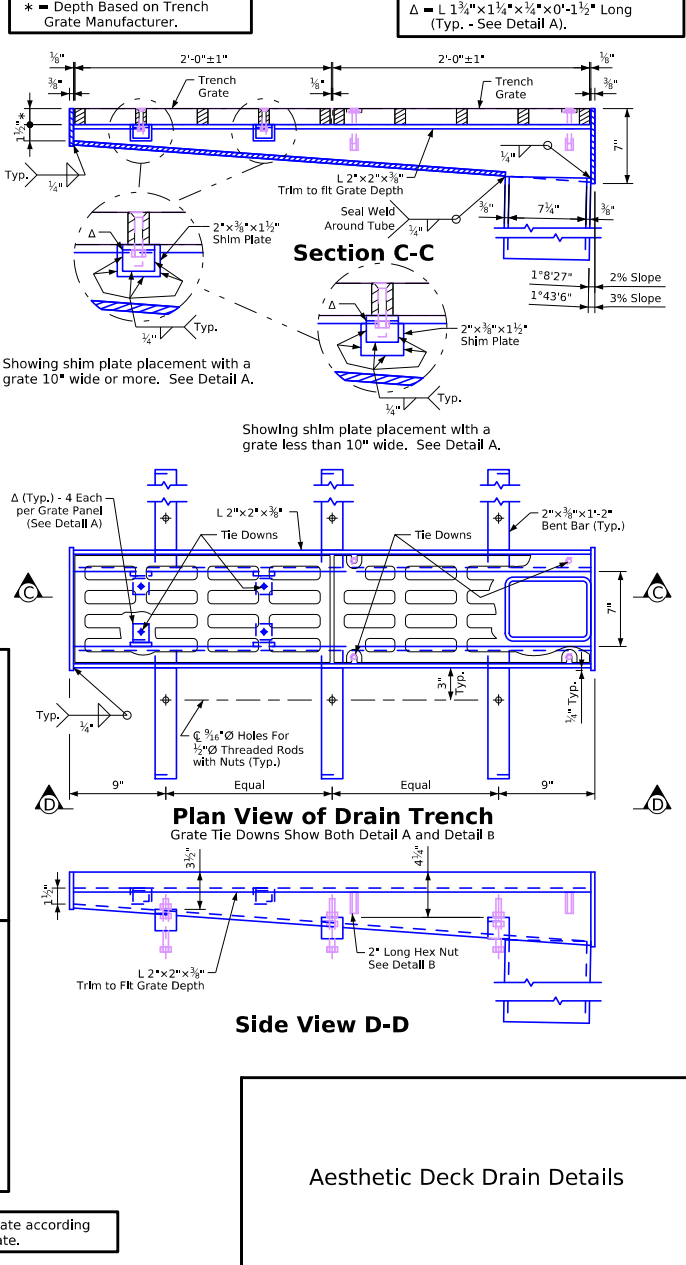
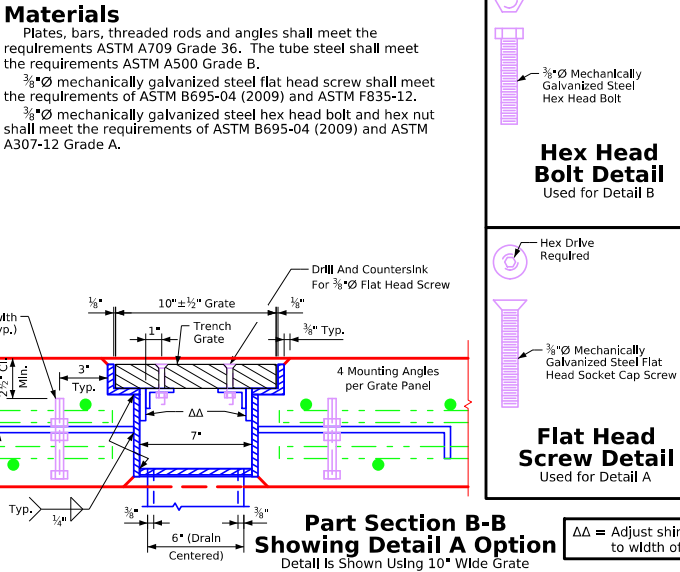
Drains shall be centered over the nearest bottom transverse deck reinforcing bar from the location designated on the situation plan. The bottom transverse deck reinforcing bar shall be cut off to provide 1" clearance from the drain. The top transverse deck reinforcing bars on each side of the drain, shall be spaced as necessary to provide 1" clearance from the drain. Longitudinal deck reinforcing bars that conflict with the drain shall be cut off to provide 2" clearance from the drain. All cut ends of bars shall be coated with epoxy patching material supplied by the Manufacturer of the epoxy coating. Longitudinal deck reinforcing bars shall be shifted as necessary to accommodate anchor bars.

Materials

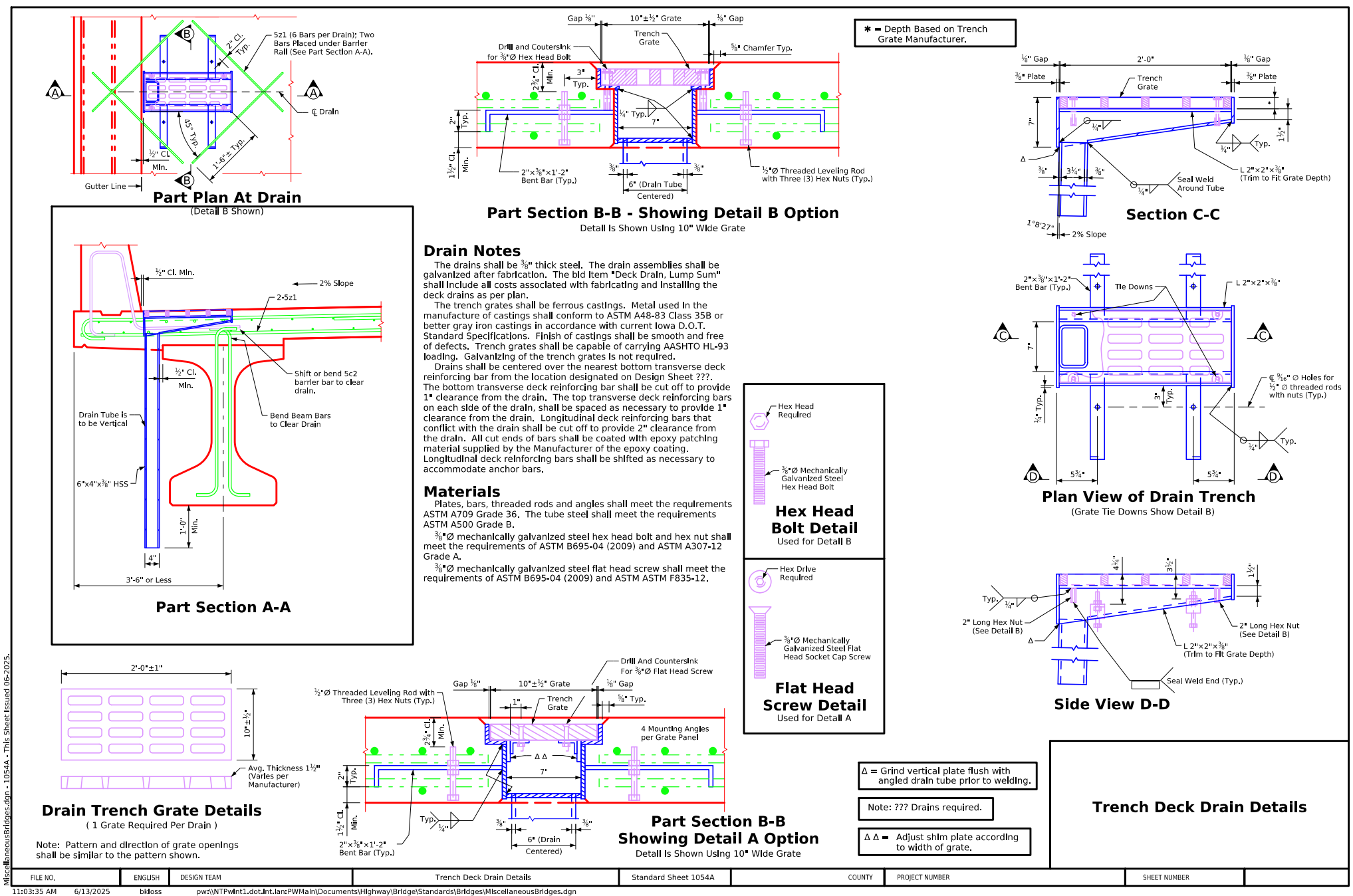
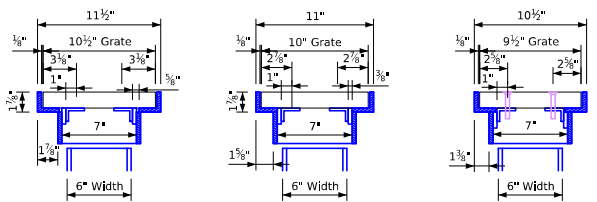
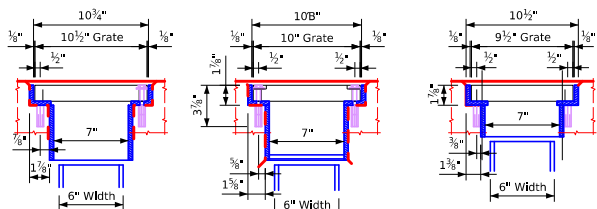
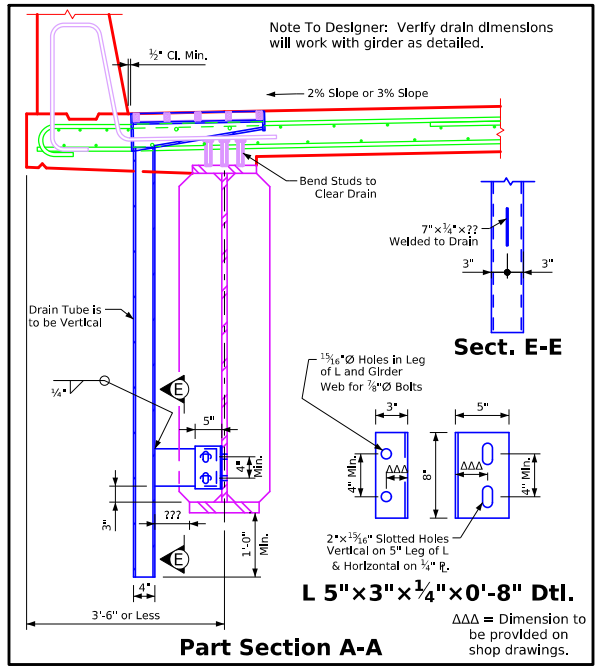
Plates, bars, threaded rods and angles shall meet the requirements ASTM A709 Grade 36. The tube steel shall meet the requirements ASTM A500 Grade B.

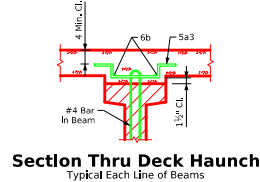
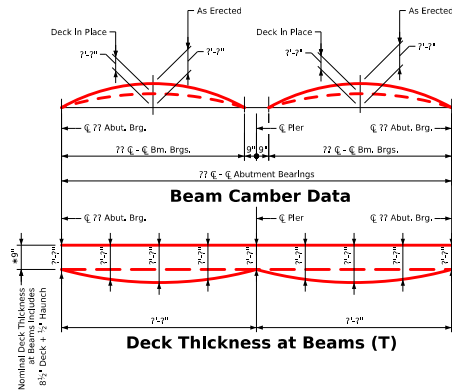
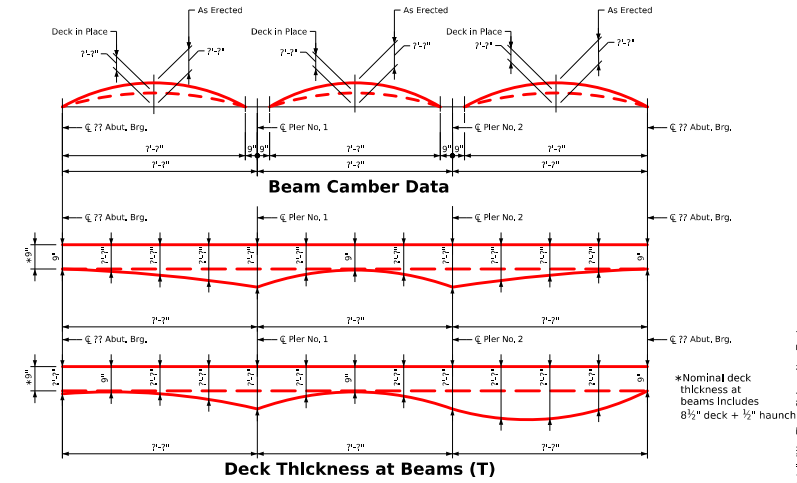
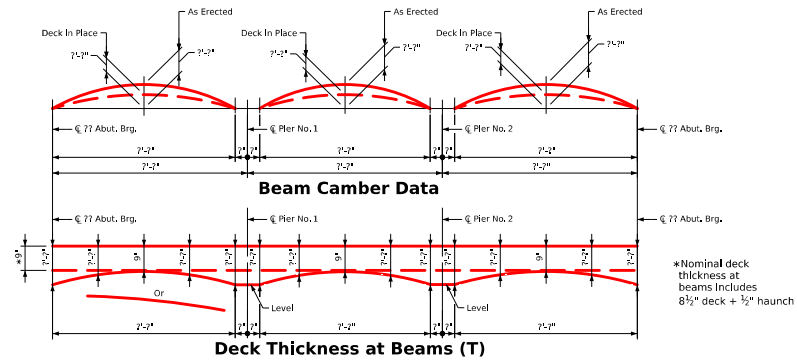
3/8" mechanically galvanized steel flat head screw shall meet the requirements of ASTM B695-04 (2009) and ASTM F835-12.

3/8" mechanically galvanized steel hex head bolt and hex nut shall meet the requirements of ASTM B695-04 (2009) and ASTM A307-12 Grade A.



FILE NO.	ENGLISH	DESIGN TEAM	Aesthetic Deck Drain Details	Standard Sheet 1054	COUNTY	PROJECT NUMBER	SHEET NUMBER
11:03:34 AM	6/13/2025	bldoss	pwt:\NTP\wnt1.dot\Int.lan:PWM\Main\Documents\Highway\Bridges\Standards\Bridges\Miscellaneous\Bridges.dgn				

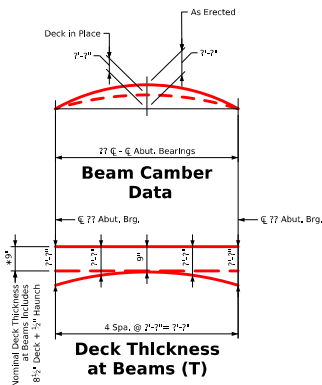
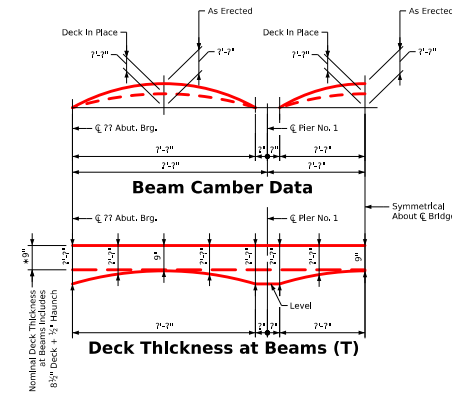




Section Thru Deck Haunch
Typical Each Line of Beams

Haunch Reinforcing Layout
(Required at All Piers)

Note: Place one 5a2 bar adjacent to each #4 beam stirrup (4b1 bars on Design Sheets, 77 & 77) that extend from the beams into the deck haunch.



Note: Place one 5a2 bar adjacent to each #4 beam stirrup (4b1 bars on Design Sheets 77, 77 & 77) that extend from the beams into the deck haunch. The 5a4 bars may be lifted as necessary to fit under the top of deck reinforcing mat and maintain the 4" minimum dimension shown.

Note to Designer: See Examples Outside of Sheet Border.

Beam Camber Data

Deck Thickness at Beams (T)

Deck Thickness Details

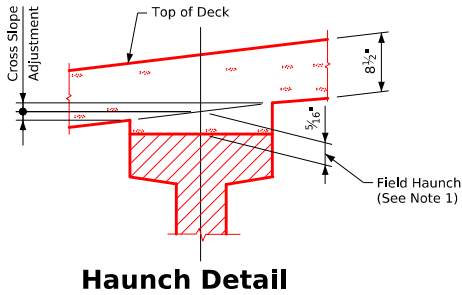
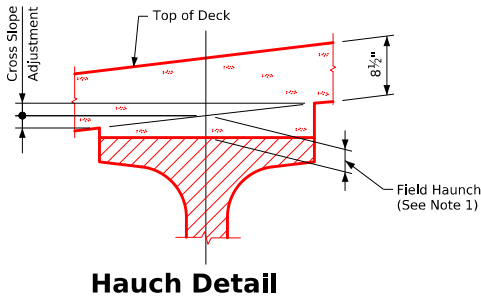
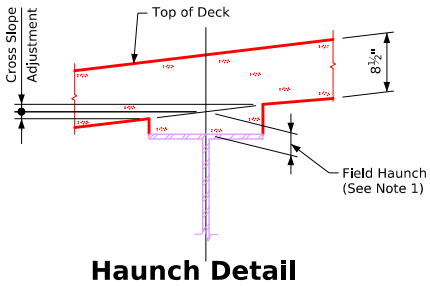
Note: The deck thickness (T) at beams is based on the anticipated beam camber and deflections. These values are used by the Designer to set beam elevations and estimate concrete quantities. Refer to the haunch data details sheet for additional information to aid the Contractor in setting the field haunches required for construction.

FILE NO.	ENGLISH	DESIGN TEAM	Beam Camber and Deck Thickness Details	Standard Sheet 1065	COUNTY	PROJECT NUMBER	SHEET NUMBER
11-03-36 AM	6/13/2025	bldss	pw:\NTP\wkt1.dot\h.lan:PWM\h\Documents\Highway\Bridges\Standards\Bridges\Miscellaneous\Bridges.dgn				

Control Point:

Beam Line Haunch Elevations																						
	⌄ ? Abut. Bearing					⌄ Pier No. 1 Bearings											⌄ Pier No. 2 Bearings					⌄ ? Abut. Bearing
Location	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	LINE 16	Line 17	Line 18	Line 19	Line 20	Line 21	
Beam Line A																						
Beam Line B																						
Beam Line C																						
Beam Line D																						
Beam Line E																						
Beam Line F																						
Beam Line G																						
Beam Line H																						

Miscellaneous Data Table																				
	Beam Line	⊕ ? Abut. Bearing					⊕ Pier No. 1 Bearing									⊕ Pier No. 2 Bearings				
		Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10	Line 11	Line 12	Line 13	Line 14	Line 15	Line 16	Line 17	Line 18	Line 19
Anticipated Deflection Due to Deck (In.)	All	0				0	0										0	0		
Cross Slope Adjustments (In.)	A, B, C, D, E & F																			
	C																			
Allowable Field Haunch (In. & ft.)	Max.	All																		
	Min.	All																		



Note: Bridge seat elevations are set based on theoretical camber and beam deflections. These bridge seats will provide a theoretical beam haunch within design parameters. Field haunches are determined using surveyed top of beam elevations and "Beam Line Haunch Elevation" data. Allowable maximum and minimum "Field Haunch" values are given in inches and decimals of feet in the "Miscellaneous Data" table. "Cross slope adjustment" values will aid the Contractor in determining actual formed haunch dimensions at the edges of the top flange.

Note 1: To calculate field haunch required at each location, survey the beam tops consistent with the spacings shown on the "Top of Deck Elevations Layout". Subtract the surveyed beam shot from the "Beam Line Haunch Elevation". This value will be the haunch needed (see "Field Haunch" in haunch detail). The "Beam Line Haunch Elevation" includes adjustments for deck thicknesses and anticipated deflections. No additional calculations are required. If the field haunch exceeds the maximums and minimums shown in inches and decimals of feet in the miscellaneous data table, adjustments to the grade or additional haunch reinforcement will be required.

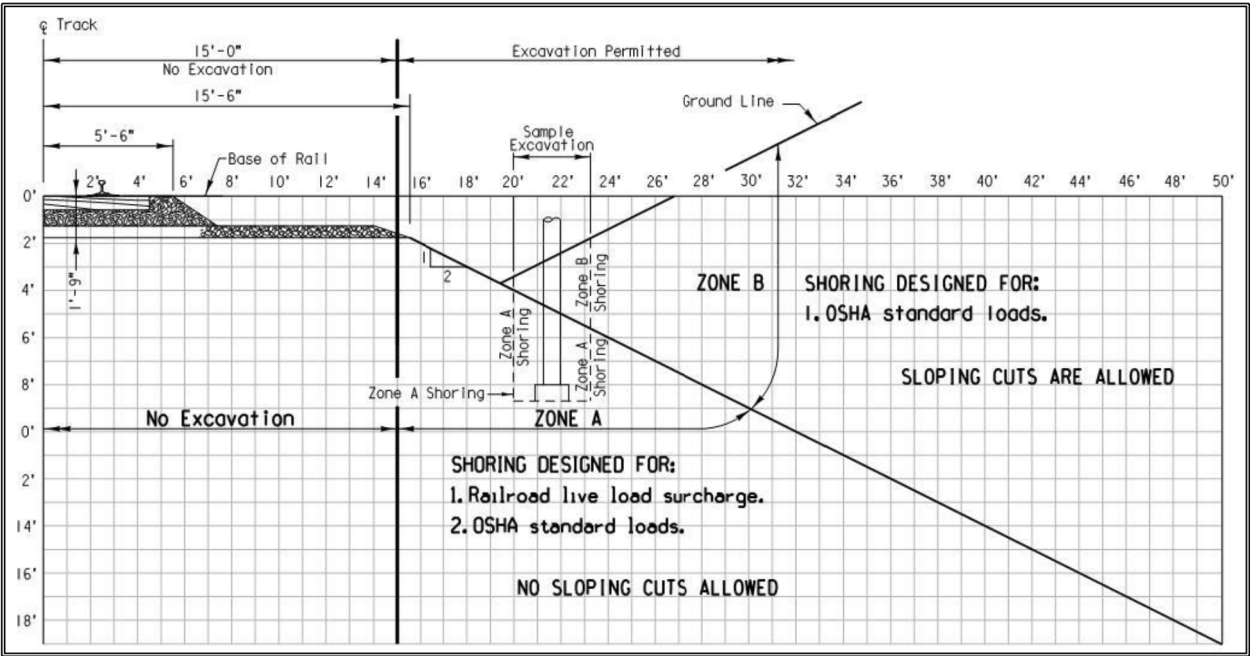
Note: Haunch locations are at the same location as the encircled letters and numbers shown on deck elevations sheet.

Deck Haunch Data Details

FILE NO.	ENGLISH	DESIGN TEAM	Deck Haunch Data Details	Standard Sheet 1066	COUNTY	PROJECT NUMBER	SHEET NUMBER
11:03:37 AM	6/13/2025	bkloss	pw:\NTP\wint1.dot\int.lan:PWMain\Documents\Highway\BridgeStandards\Bridges\MiscellaneousBridges.dgn				

Issued 12-2008.
Revised 09-13: Railroad Changed the Minimum Vertical Construction Clearance to 21'-6". Distance From Mainline Track to Edge of Embankment Changed to 15'-6".
Revised 05-17: Added Note Outside of Sheet Border to Explain the Use of this Strand Sheet with Archived Methods (Memo MM201).

Revised 07-2019: For UPRR, Changed Horizontal Distance of Minimum Construction Clearance Envelope to 15'-0" (Was 12'-0").
Revised 03-2022: Updated "General Excavation Zones" Detail and "General Shoring Notes" to follow the "UPRR & BNSF Guidelines for Temporary Shoring, 2021".
MiscellaneousBridges.dgn - 1067 - This Sheet RedIssued 11-2023. Sheet Format Update.



General Excavation Zones

Source: UPRR & BNSF Guideline for Temporary Shoring, 2021

Railroad General Notes:

Railroad review and approval of shoring, erection, demolition, and falsework is required. Allow a minimum of four weeks for the review and approval of each submittal.

The proposed grade separation project shall not increase the quantity and/or characteristics of the flow in the railroad's ditches and/or drainage structures.

The elevation of the existing top-of-rail profile shall be verified before beginning construction. All discrepancies shall be brought to the attention of the railroad prior to construction.

The Contractor must submit a proposed method of erosion and sediment control and have the method approved by the railroad.

All shoring systems that impact the railroad's operations and/or supports the railroad's embankment shall be designed and constructed per current railroad guidelines for temporary shoring.

All demolitions within the railroad's right-of-way and/or demolition that may impact the railroad's tracks or operations shall be in compliance with the railroad's demolition guidelines.

Erection over the railroad's right-of-way shall be designed to cause no interruption to the railroad's operation, enabling the track(s) to remain open to traffic per the railroad's requirements.

All construction phasing that may impact the railroad operations shall be designed to cause no interruption to the railroad's operation, enabling the track(s) to remain open to traffic per the railroad's requirements.

False-work clearances shall comply with minimum construction clearances.

All permanent clearances shall be verified before project closing.

For railroad coordination please refer to the railroad coordination requirements as part of special provisions.

General Shoring Notes:

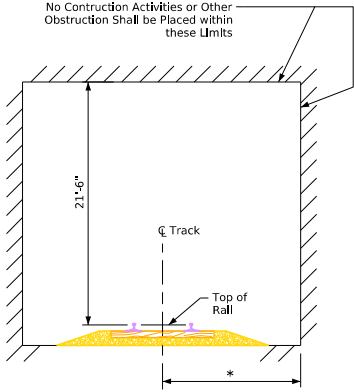
All dimensions are measured perpendicular to track.

Prior to commencing any work, the Contractor shall submit for approval by the Railroad detailed plans indicating the nature and extent of the track protection shoring proposed. The Contractor shall install the temporary shoring system per the approved plans.

Design of the temporary shoring system to comply with UPRR & BNSF Guidelines for Temporary Shoring.

For excavations which encroach into Zone A or B, shoring plans shall be accompanied by design calculations. Plans and calculations must be signed and stamped by a Professional Engineer registered in the State of Iowa.

Note:
BNSF = Burlington Northern Santa Fe Railroad
UPRR = Union Pacific Railroad



Minimum Construction Clearance Envelope
(Normal to Railroad)

* 15'-0" for BNSF and 15'-0" for UPRR

Top of Rail Elevations
(Stations Increase with Milepost Increase)

Main Line			
Alignment: Left Rail		Alignment: Right Rail	
Station	Elevation	Station	Elevation
0+00		0+00	
1+00		1+00	
2+00		2+00	
3+00		3+00	
4+00		4+00	
5+00		5+00	
6+00		6+00	
7+00		7+00	
8+00		8+00	
9+00		9+00	
① 10+00		① 10+00	
11+00		11+00	
12+00		12+00	
13+00		13+00	
14+00		14+00	
15+00		15+00	
16+00		16+00	
17+00		17+00	
18+00		18+00	
19+00		19+00	
20+00		20+00	

① Existing Track Sta. 10+00

BNSF & UPRR General Notes & Shoring

This information shown below is what is to be included on the TS&L sheet (Situation Plan) when this Standard Sheet 1067 is used.

In discussions with the BNSF and UP railroads, the Bridge Bureau has agreed to provide the standard sheet 1067 and the information listed below.

This information will be provided by Preliminary Bridge Design Unit on the Plan View and Elevation View on the TS&L sheet of all bridge projects that involve BNSF and UP railroad except the items noted with an asterisk (*). These items will be provided by the Final Bridge Design Units.

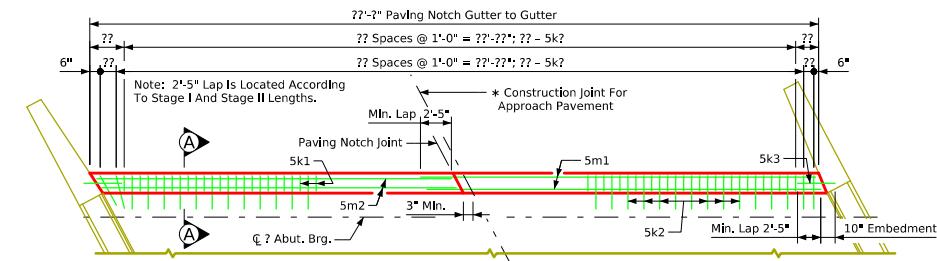
Final Design Units should review the list to make sure all information is provided. See archived Methods Memo MM201 for further explanation.

Plan View

- Centerline of bridge and/or centerline of project.
- Track layout and limits of railroad right-of-way with respect to centerline of main lines.
- Future tracks, access roadways and existing tracks as main line, siding, spur, etc.
- Horizontal clearance at right angle from centerline of nearest existing or future track to the face of obstruction such as substructure above grade.
- Horizontal clearance at right angle from centerline of nearest existing or future track to the face of nearest foundation below grade.
- Horizontal spacing at right angle between centerlines of existing and/or future tracks.
- Limits of shoring and minimum distance at right angle from centerline of nearest track.
- All existing facilities and utilities.
- Existing ground shots and proposed grading.
- Railroad Milepost and direction of increasing Milepost (Provided by Railroad).
- Direction of flow for all drainage systems within project limits.
- Limits of barrier rail and fence with respect to centerline of track.
- Location of deck drains (Note drains shall not be located over the railroad right-of-way).
- Total width of superstructure.
- Width of shoulder and/or sidewalk.
- North arrow
- Footprint of proposed superstructure and substructure including existing structure if applicable

Elevation View

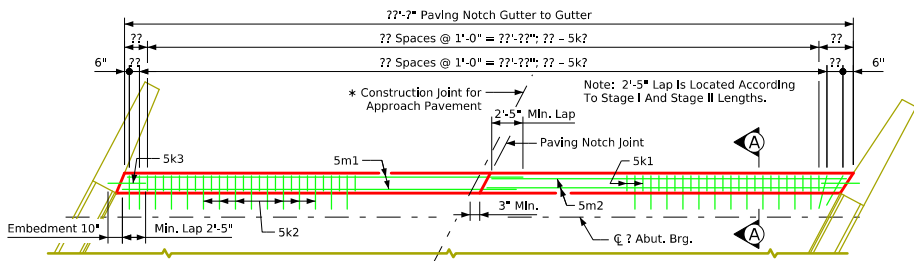
- Future tracks, access roadways and existing tracks as main line, siding, spur, etc.
- Point of minimum vertical clearance and distance within the vertical clearance envelope, measured perpendicular from the centerline of nearest track.
- Limits of shoring and minimum distance at right angle from centerline of nearest track.
- Toe of slope and/or limits of retaining wall.
- Limits of barrier rail and fence with respect to centerline of track.
- Depth of foundation from top of tie / base of rail.
- Top and bottom of pier protection wall elevation relative to top of rail elevation.
- Controlling dimensions of drainage ditches and/or drainage structures.
- Top of rail elevations for all tracks.
- Minimum permanent vertical clearance above the top of high rail to the lowest point under the bridge.
- Existing and proposed groundline and roadway profile.
- Show slope and specify type of slope paving. Toe of slope shall be shown relative to drainage ditch and top of subgrade.



Note: 5k3 bars shall be set as dowels embedding 10 inches minimum into the existing bridge wingwalls and extending a minimum of 2'-5" into the new paving notch replacement.

Part Plan View At Abutment

Note: New Paving Notch Replacement should extend from bridge wingwall to bridge wingwall.

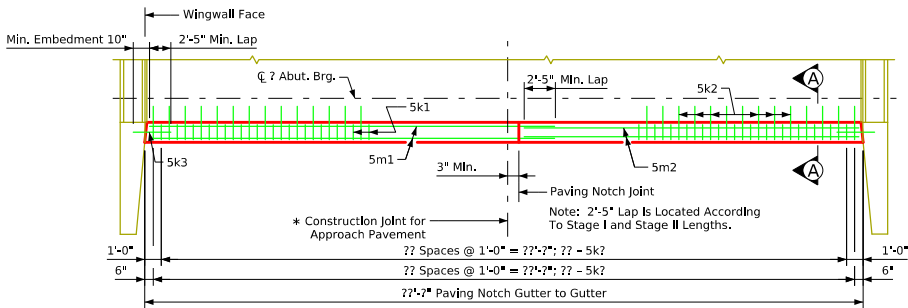


Note: 5k3 bars shall be set as dowels embedding 10 inches minimum into the existing bridge wingwalls and extending a minimum of 2'-5" into the new paving notch replacement.

Part Plan View At Abutment

Note: New Paving Notch Replacement should extend from bridge wingwall to bridge wingwall.

Note to Detailer:
See Skew Examples Outside of Sheet Border.



Note: 5k3 bars shall be set as dowels embedding 10" minimum into the existing bridge wingwalls and extending a minimum of 2'-5" into the new paving notch replacement.

Part Plan View At Abutment

Note: New paving notch replacement should extend from bridge wingwall to bridge wingwall.

* Construction joint for notch repair to extend a minimum of 3 Inches past construction joint for pavement. Provide 2'-5" minimum lap for reinforcement.

Note:
Use "BR-203" Approach Pavement Standard for Moveable Abutment.

Location

?? (label route over road/stream)
In City of ??? (if applicable)
T-??N R-??W
Section ??
?? Township
?? County
FHWA No. ?? (if applicable)
Bridge Maint. No. ?? (if applicable)
Asset ID No. ?? (if applicable)
FRA No. (if applicable)
Latitude ??.123456°
Longitude -??.123456°

Paving Notch Replacement Notes:

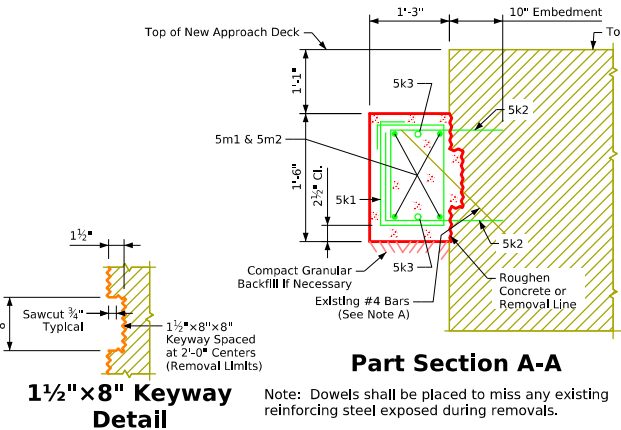
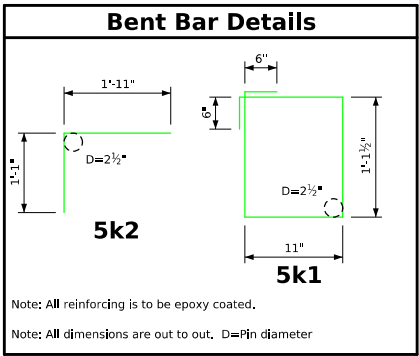
The Paving Notch Replacement is to be Class "C" structural concrete. Minimum clear distance from face of concrete to near reinforcing bar is to be 2", unless otherwise noted or shown. The bid item "Paving Notch Replacement" linear feet, shall include all costs of labor and materials associated with excavation, removing, and disposing of the existing paving notch, granular backfill and compaction as needed, and installing the new paving notch. This work shall include, cutting of the existing #4 bars, removing the concrete for the shear keyways, drilling the holes for the deformed dowels, and constructing the new notch to the dimensions shown. The new notch is estimated at 0.07 cubic yards per foot of structural concrete and 16.0 pounds of epoxy coated reinforcing steel per foot. Removals shall be in accordance with Section 2401, of the Standard Specifications. 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

Dowel Setting Note:

The deformed 5k2 & 5k3 bars shall be set as dowels in drilled holes. Holes are to be 10" deep. Polymer grout system shall be used to install the deformed dowel bars in accordance with Article 2301.03,E, of the Standard Specifications and the Grout Manufacturer's recommendations.

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.
?
?
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.

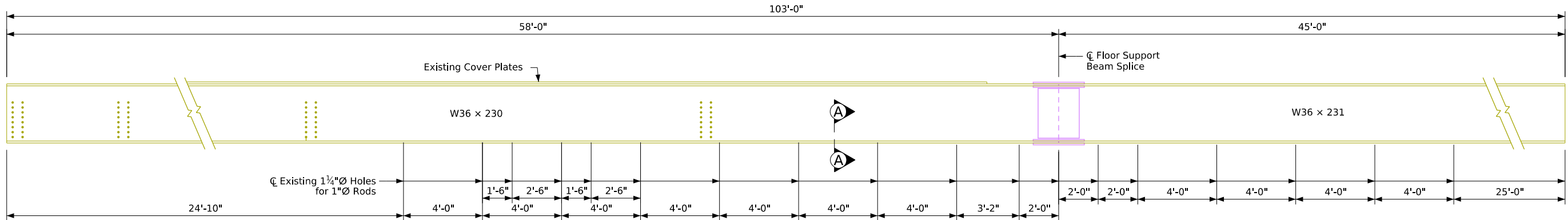


Design History at this Site (Includes this Design)	
Des. No.	Type of Work
???	Original Design
???	???

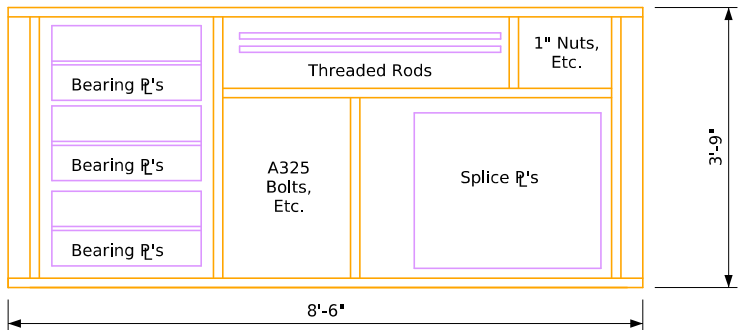
Paving Notch Replacement

FILE NO.	ENGLISH	DESIGN TEAM	Paving Notch Replacement		Standard Sheet 1068	COUNTY	PROJECT NUMBER	SHEET NUMBER	
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Issued 05-2008.
Revised 11-2009: High Strength Bolt Replacement Note was Deleted.
MiscellaneousBridges.dgn - 1090 - This Sheet Re-Issued 11-2023. Sheet Format Update.

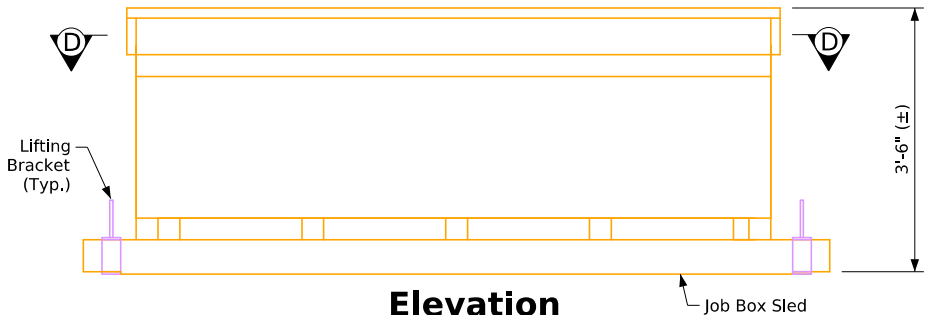


Elevation View of Floor Support Beam



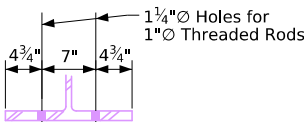
View D-D

Showing Interior Partitions
(Lid Not Shown)

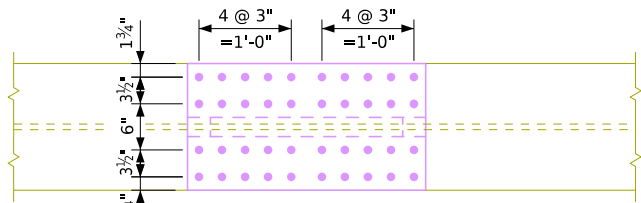


Elevation

Job Box Details

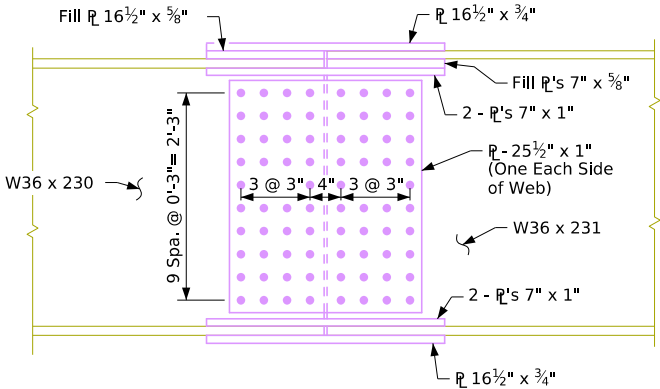


Part Section A-A

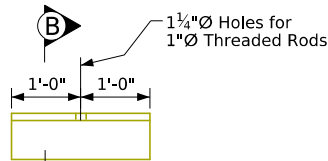


Flange Splice Details

(Typ. Top & Bottom Flanges)

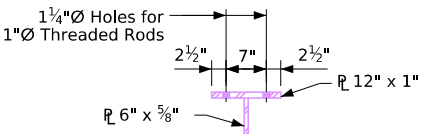


Floor Support Beam Splice Details

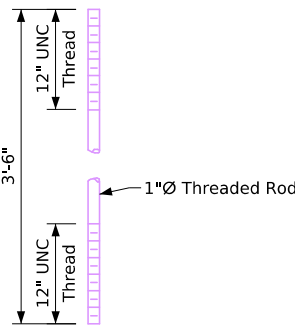


Bearing Pl.

(19 Pieces)



Section B-B



Threaded Rod Details

(38 Pieces)

Note: The 1"Ø threaded rods are to have a washer and two heavy hexagonal nuts on the bottom and a washer and one heavy hexagonal nut on the top.

Floor Support Beam System Notes:

The floor support beam system is the property of the Iowa D.O.T., and is stored at the Iowa D.O.T. maintenance yard in Ames at intersection of I-35/US30. The floor support beam sections and job box containing items listed in inventory on this sheet are located at facility in NE corner of yard. Floor support beam sections, 58'-0" and 45'-0" lengths, are not spliced together in storage. Job box, containing bolted field splice materials, threaded rods and bearing plates, is to be transported to any future jobsite by Contractor.

The lump sum bid item "Structural Steel, Haul + Storing" shall include all costs associated with the handling and transport of the floor support beam system from the Iowa D.O.T. maintenance yard in Ames to the jobsite, and returning these materials.

The floor support beam system shall be stored at the Iowa D.O.T. maintenance yard in Ames at the conclusion of any project employing these materials. There shall be no exceptions to this requirement.

High Strength Bolts

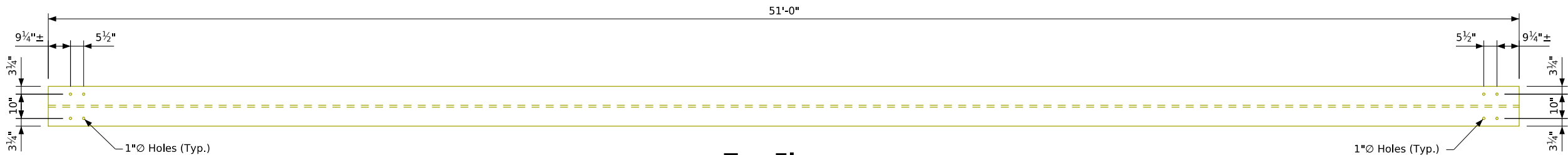
Number	Item	Location
88	7/8"Ø x 4" A325 Bolts	Web
44	7/8"Ø x 4 1/4" A325 Bolts	Bottom Flange
44	7/8"Ø x 5" A325 Bolts	Top Flange
176	7/8"Ø Hex Nut	
176	7/8"Ø Washer	

Job Box Inventory

Number	Item	Location
2	Web Splice Pl 25 1/2" x 1" x 30 1/2"	
4	Flange Splice Pl 7" x 1" x 31 1/2"	
2	Flange Splice Pl 16 1/2" x 3/4" x 31 1/2"	
1	Fill Pl 15 3/4" x 5/8" x 16 1/2"	Top Flange
2	Fill Pl 7" x 5/8" x 16 1/2"	Top Flange
19	Bearing Pl - 2'-0" Lengths	
38	1"Ø x 3'-6" Threaded Rods	
84	Washers for Threaded Rods	
125	Heavy Hex Nuts for Threaded Rods	

Floor Support Beam Details

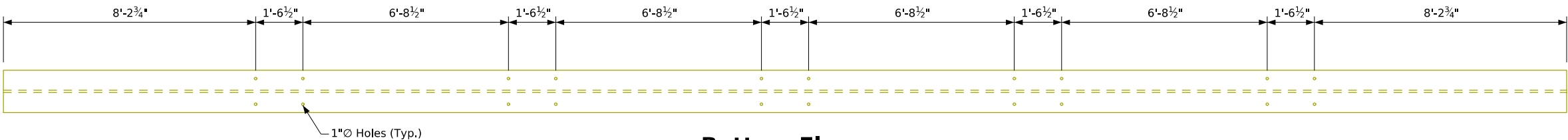
Issued 09-2014
MiscellaneousBridges.dgn - 1090A - This Sheet Re-Issued 11-2023. Sheet Format Update.



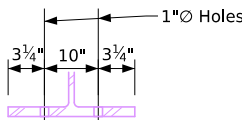
Top Flange



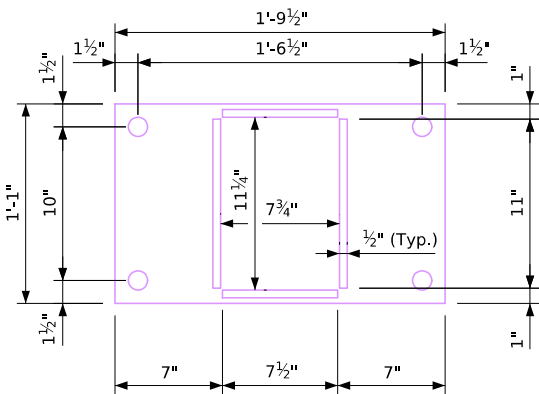
Elevation



Bottom Flange



Part Section A-A



Bearing Plate

(5 Total)

Support Beam Notes:

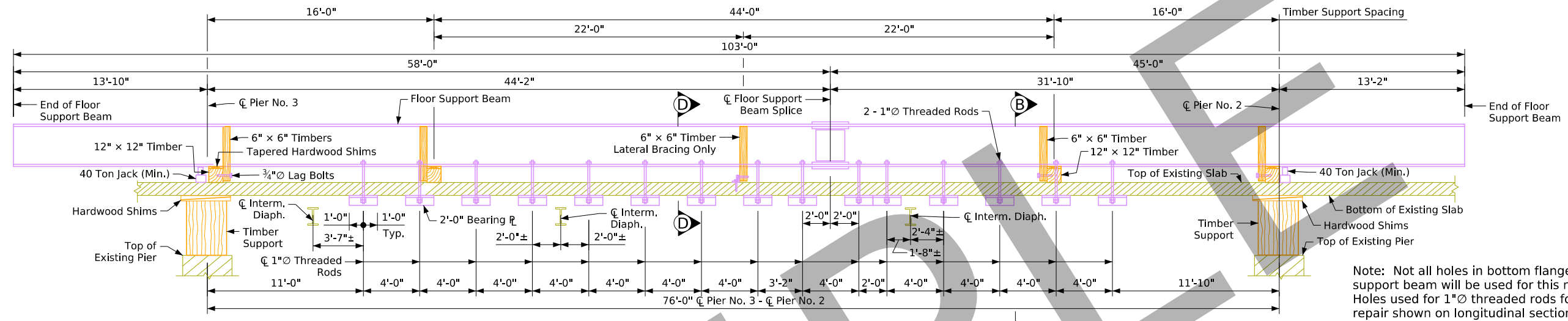
The support beams are the property of the Iowa D.O.T., and there are two identical beams stored at the Iowa D.O.T. maintenance yard in Ames at the intersection of I-35/US30. The support beam sections are located at the facility in the NE corner of the yard. The support beams were originally fabricated in August 2004 for Buchanan County Design 104. The support beams are A709 Grade 50 steel.

The lump sum bid item "Structural Steel, Haul + Storing" shall include all costs associated with the handling and transport of the support beams from the Iowa D.O.T. maintenance yard in Ames to the job site, and returning these materials.

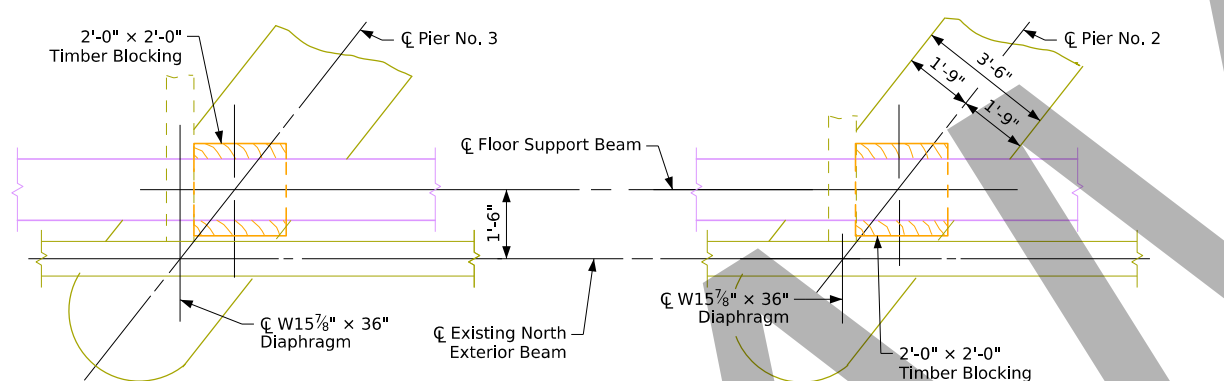
The support beams shall be returned to the Iowa D.O.T. maintenance yard in Ames at the conclusion of any project employing these materials. There shall be no exceptions to this requirement. Any missing or damaged components shall be replaced in kind at the Contractor's expense. When the support beams are stored at the job site or once they are returned to the Ames maintenance yard, the support beams shall be placed on timber dunnage off the ground.

Floor Support Beam Details

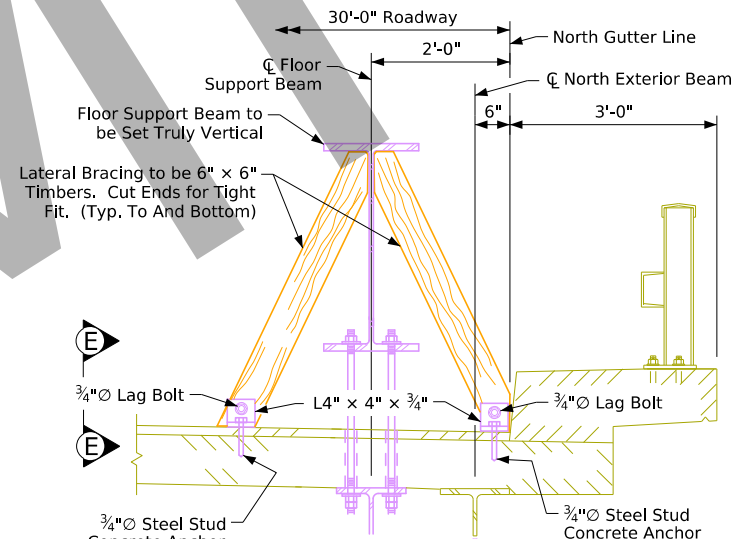
FILE NO.	ENGLISH	DESIGN TEAM	Floor Support Beam Details	Standard Sheet 1090A	COUNTY	PROJECT NUMBER	SHEET NUMBER
11:03:41 AM	6/13/2025	bkloss	pw:\NTPwint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\MiscellaneousBridges.dgn				



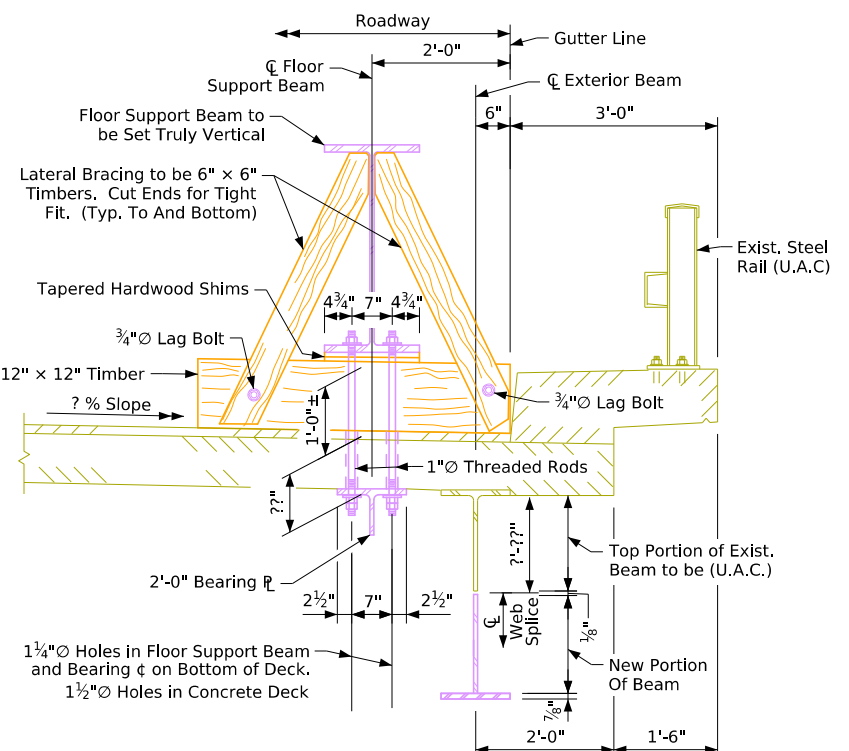
Longitudinal Section A-A
(Showing Floor Support Beam Details - Looking South)



Part Plan View Showing Timber Support for End of Floor Support Beam
(Slab Not Shown)

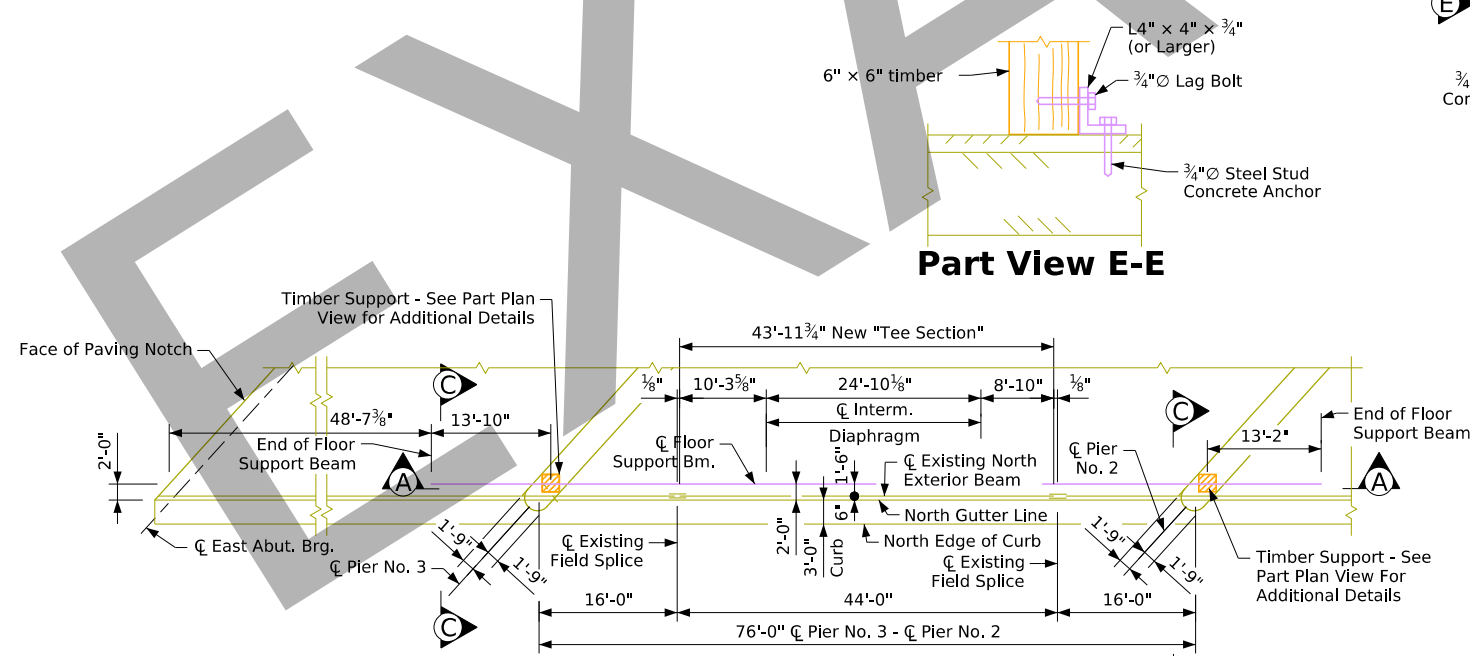


Part Section D-D

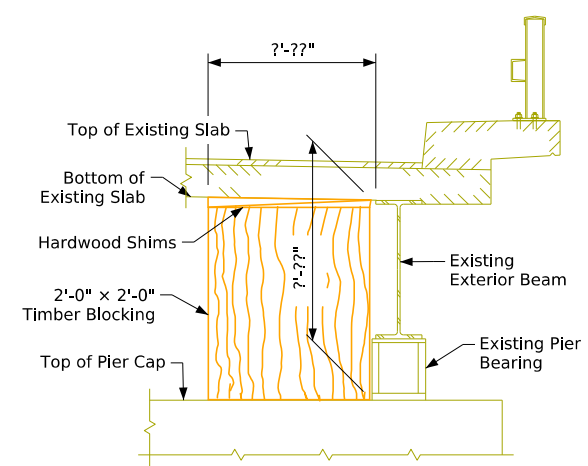


Part Section B-B

Note: See Design Sheet ??? for additional floor support beam details.



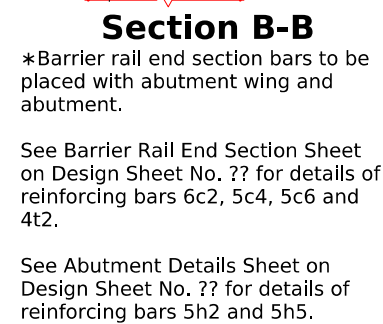
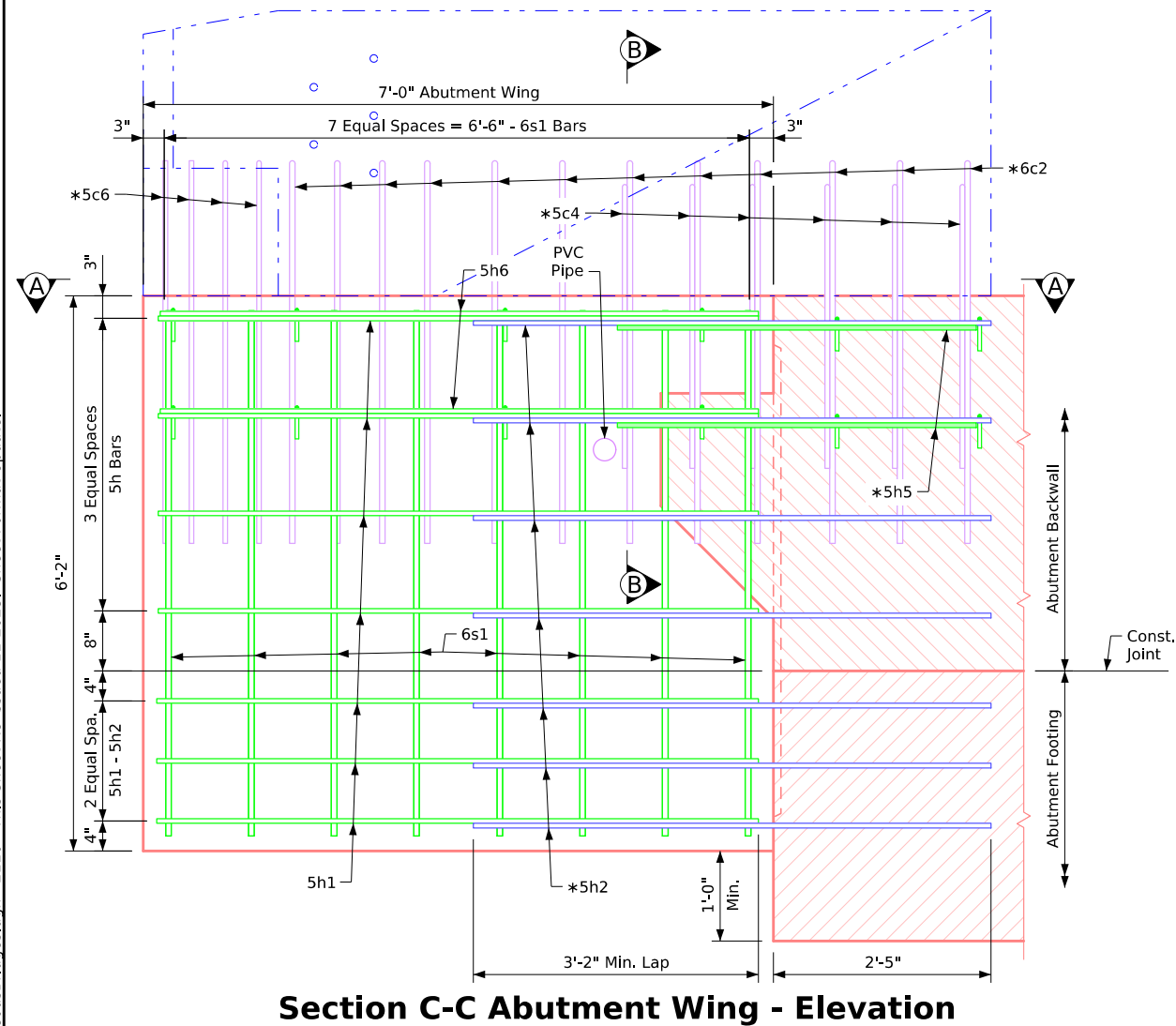
Part Plan Showing Floor Support Beam Layout and Existing Beam Layout Details



Part Section C-C
(Showing Timber Support for End of Floor Support Beam. Floor Support Beam Not Shown.)

Floor Support Beam - Layout	
FILE NO.	ENGLISH
DESIGN TEAM	Floor Support Beam Layout
Standard Sheet 1091	COUNTY
PROJECT NUMBER	SHEET NUMBER

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-8" details.
Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated 4t2 bar shape and quantity shown. Flipped/switched orientation of horizontal and vertical bars in outside face of wingwall.
MiscellaneousBridges.dgn - 2110 - This Sheet Re-Issued 11-2023. Sheet Format Update.



Bent Bar Details

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

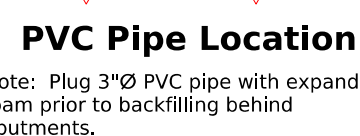
Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Integral Abutment Wing Details

expanding
d

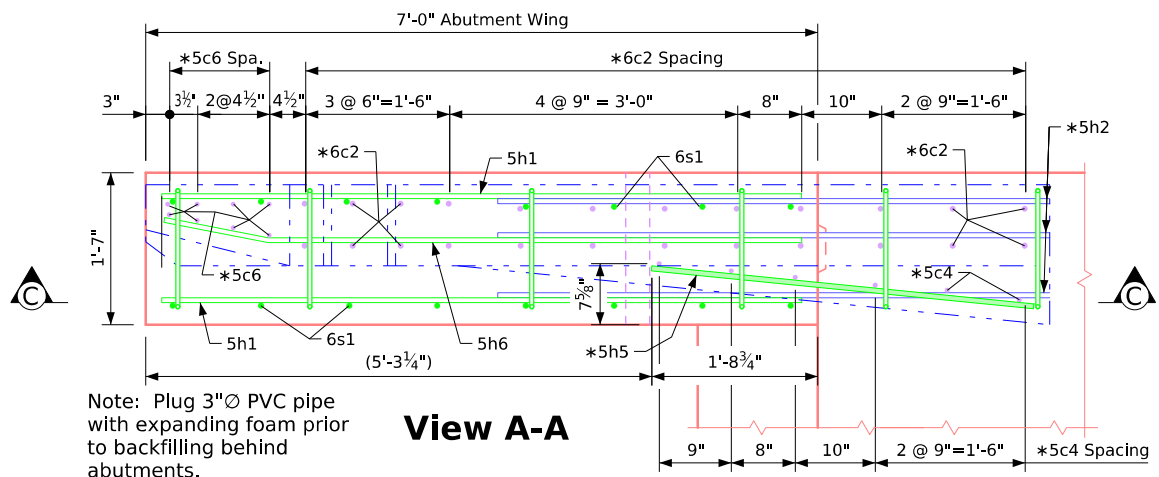
SHEET NUMBER



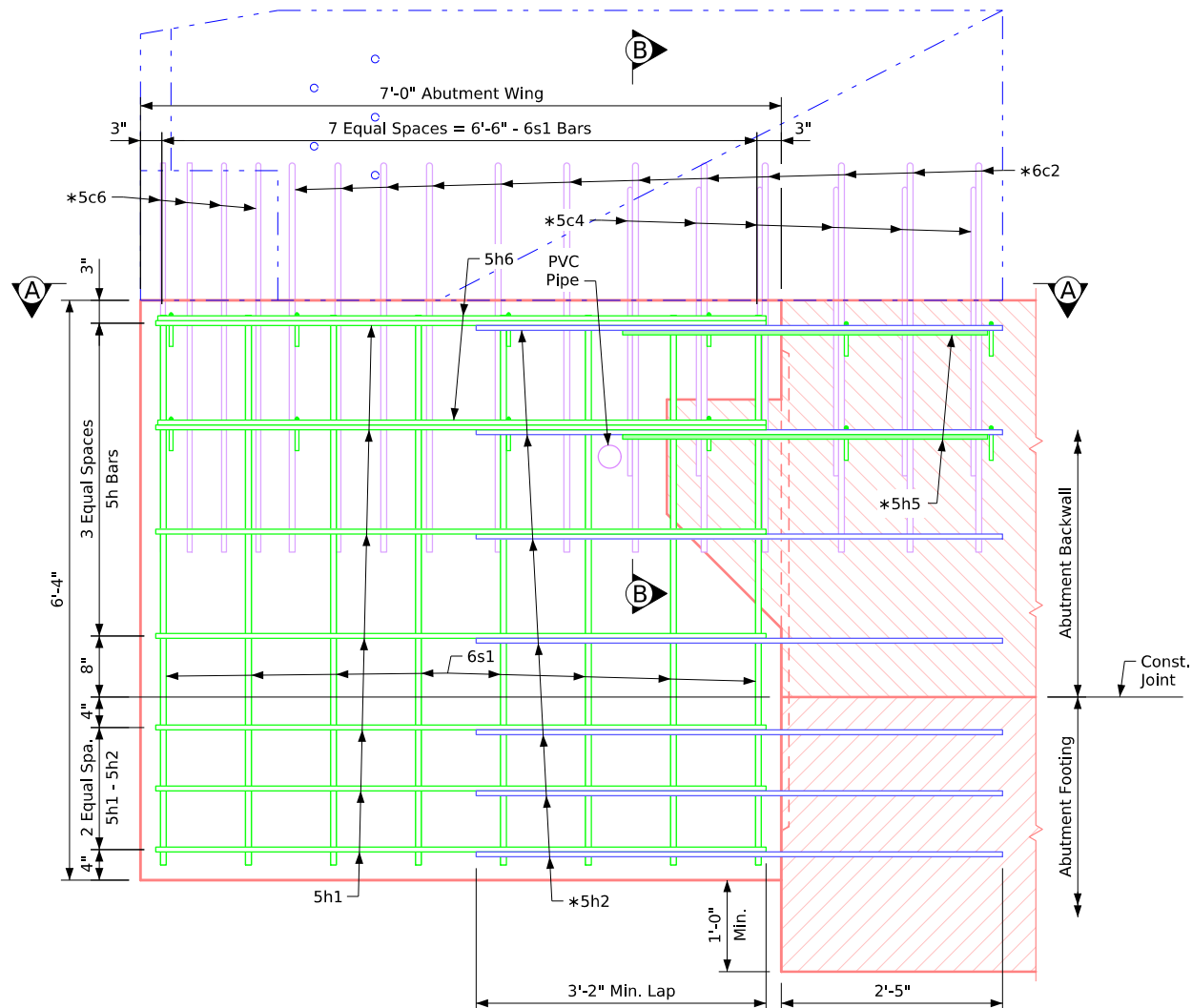
NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Integral Abutment Wing Details

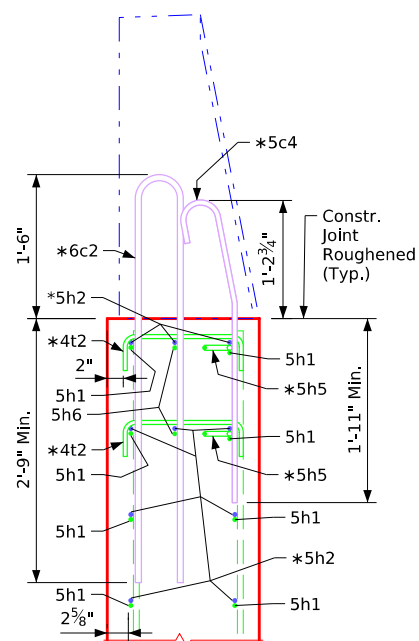
Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated 4t2 bar shape and quantity shown. Flipped/switched orientation of horizontal and vertical bars in outside face of wingwall.
MiscellaneousBridges.dgn - 2111 - This Sheet Re-Issued 11-2023. Sheet Format Update.



View A-A



Section C-C Abutment Wing - Elevation

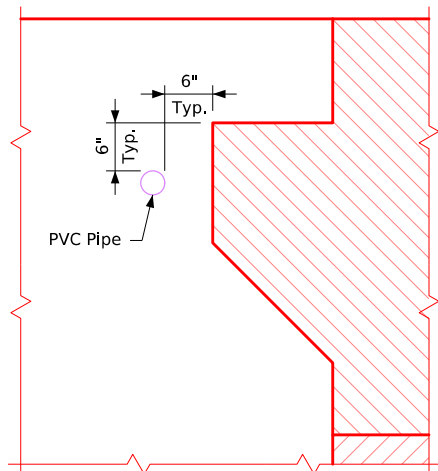


Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.

See Barrier Rail End Section Sheet on Design Sheet No. ?? for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5h2 and 5h5.



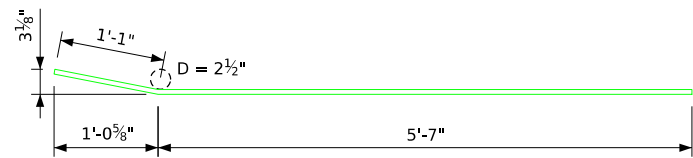
PVC Pipe Location

Note: Plug 3"Ø PVC pipe with expanding foam prior to backfilling behind abutments.

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		14	6'-8"	97
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	6'-0"	144

Epoxy Reinforcing Total Weight (lbs.) 255



Bent Bar Details

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

Concrete Placement Summary

Section	Total
One Abutment Wing	2.6
Total (cu. yds.)	2.6

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Integral Abutment Wing Details

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
 Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated MiscellaneousBridges.dgn - 2112 - This Sheet Re-Issued 11-2023. Sheet Format Updated.



See Barrier Rail End Section Sheet
on Design Sheet No. ?? for details of
reinforcing bars 6c2, 5c4, 5c6 and
4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.



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

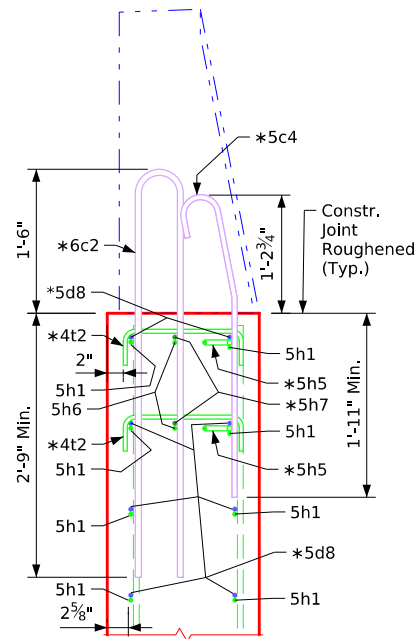
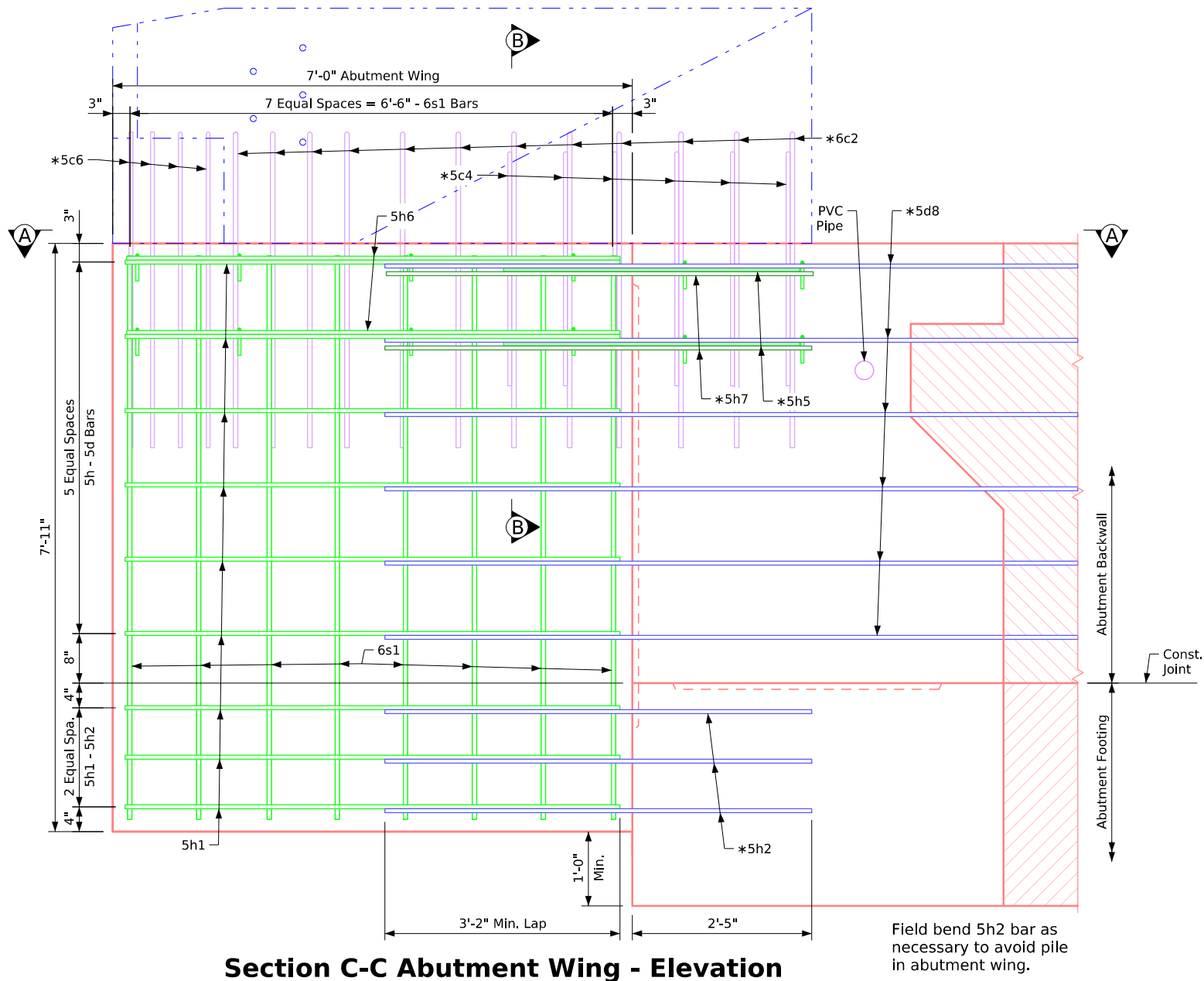
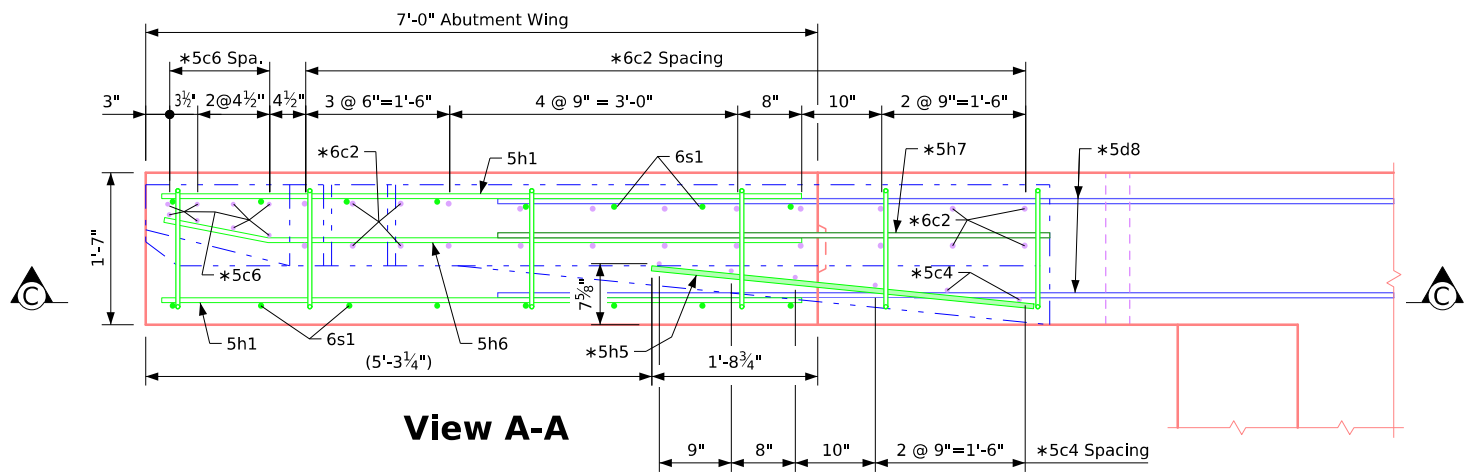
Epoxy Reinforcing Total Weight (lbs.)	305
---------------------------------------	-----

Concrete Placement Summary

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

Integral Abutment Wing Details

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated 4t2 bar shape and quantity shown. Flipped/switched orientation of horizontal and vertical bars in outside face of wingwall.
MiscellaneousBridges.dgn - 2112-S - This Sheet Re-Issued 11-2023. Sheet Format Update.



Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.

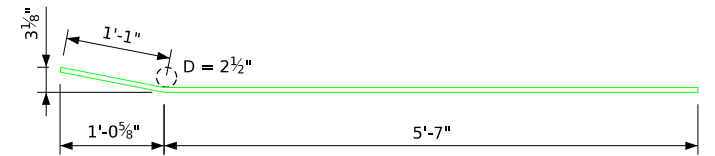
See Barrier Rail End Section Sheet on Design Sheet No. ?? for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		18	6'-8"	125
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	7'-7"	182

Epoxy Reinforcing Total Weight (lbs.) 321



Bent Bar Details

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

Concrete Placement Summary

Section	Total
One Abutment Wing	3.2
Total (cu. yds.)	3.2

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Stub Abutment Wing Details

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated MiscellaneousBridges.dgn - 2113 - This Sheet Re-Issued 11-2023. Sheet Format Updated.






A diagram of a beam with a horizontal centerline. A vertical line with arrows at both ends passes through the center of the beam. The upper part of this vertical line is labeled "Abutment Backwall" and the lower part is labeled "Abutment Footing". At the intersection of the horizontal and vertical lines, there is a small square symbol indicating a right angle. To the right of this intersection, an arrow points to the horizontal centerline with the label "Const. Joint".



See Barrier Rail End Section Sheet
on Design Sheet No. ?? for details of
reinforcing bars 6c2, 5c4, 5c6 and
4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.



Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		18	6'-8"	125
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	7'-8"	184

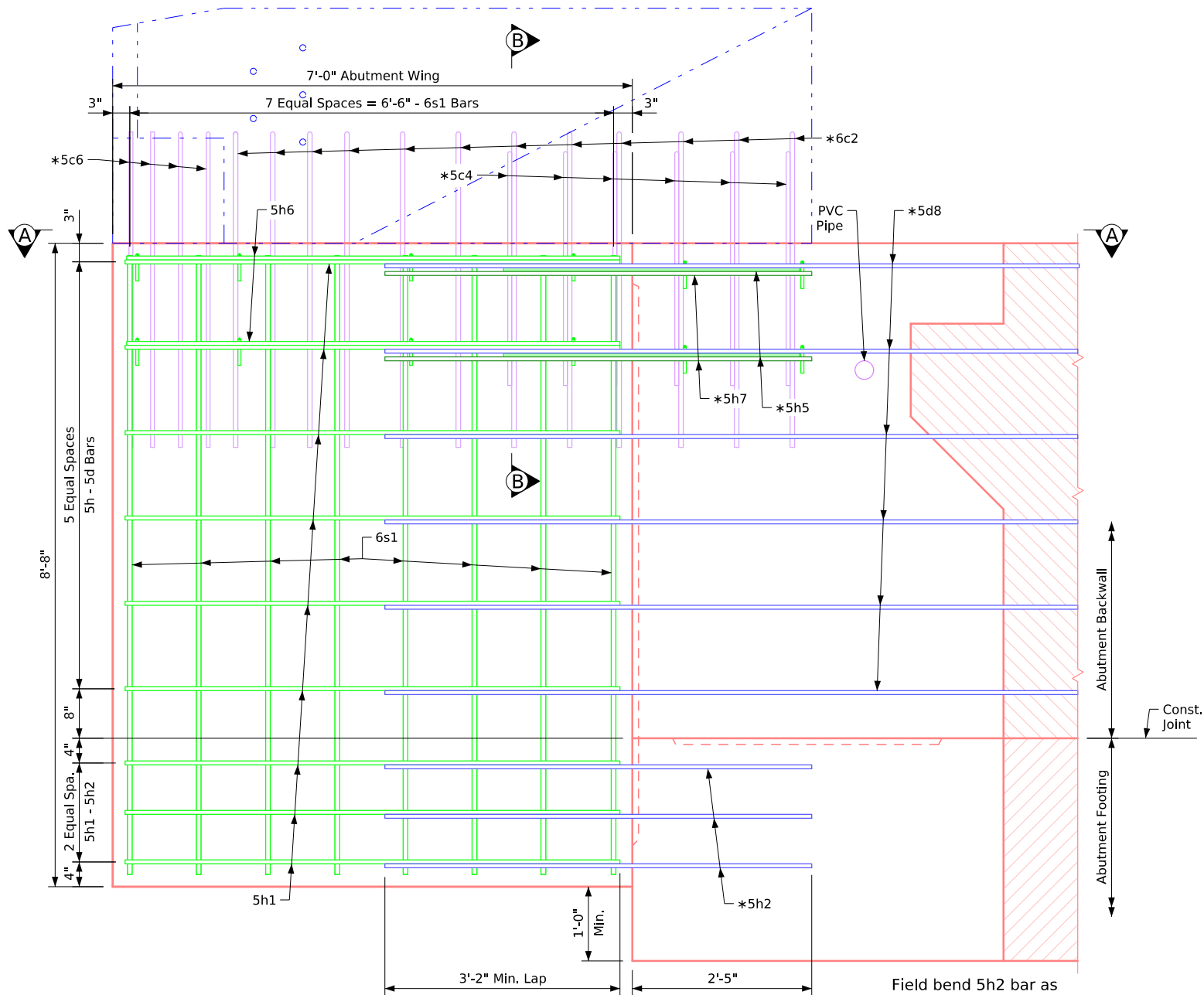
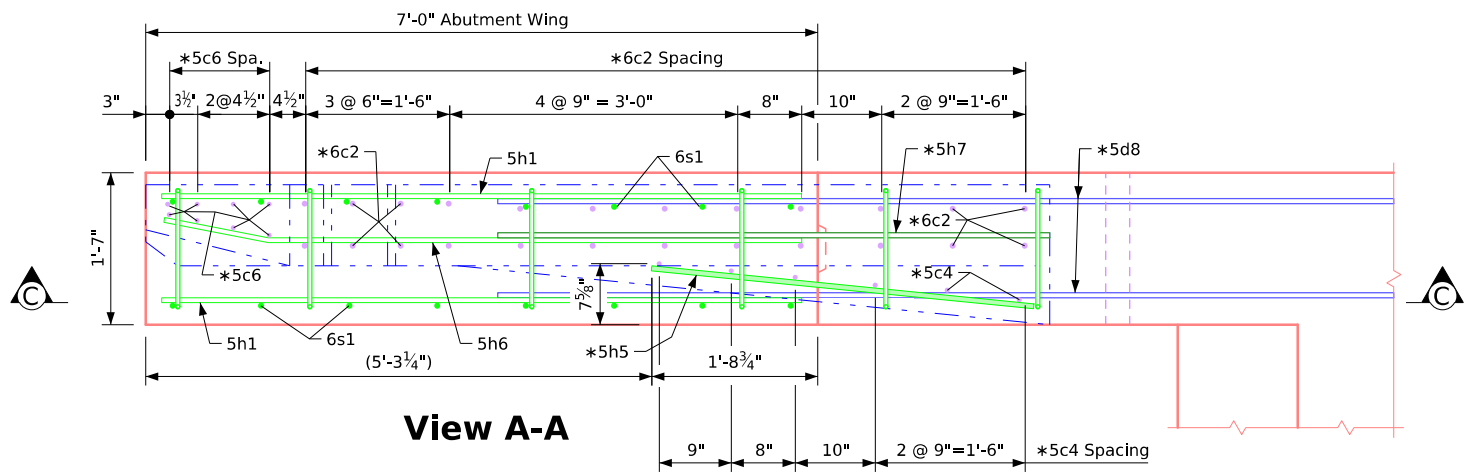
Epoxy Reinforcing Total Weight (lbs.)	323
---------------------------------------	-----

Section	Total
One Abutment Wing	3.3
Total (cu. yds.)	3.3

NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

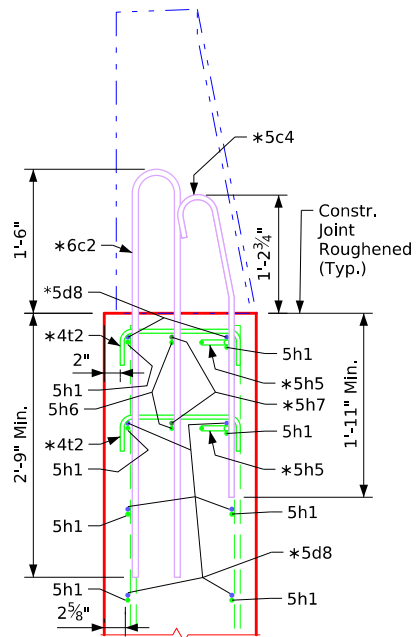
Integral Abutment Wing Details

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated 4t2 bar shape and quantity shown. Flipped/switched orientation of horizontal and vertical bars in outside face of wingwall.
MiscellaneousBridges.dgn - 2113-S - This Sheet Re-Issued 11-2023. Sheet Format Update.



Section C-C Abutment Wing - Elevation

Field bend 5h2 bar as necessary to avoid pile in abutment wing.



Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.

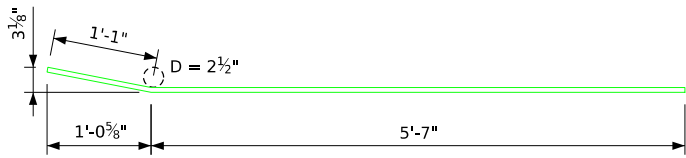
See Barrier Rail End Section Sheet on Design Sheet No. ?? for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		18	6'-8"	125
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	8'-4"	200

Epoxy Reinforcing Total Weight (lbs.) 339



Bent Bar Details

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

Concrete Placement Summary

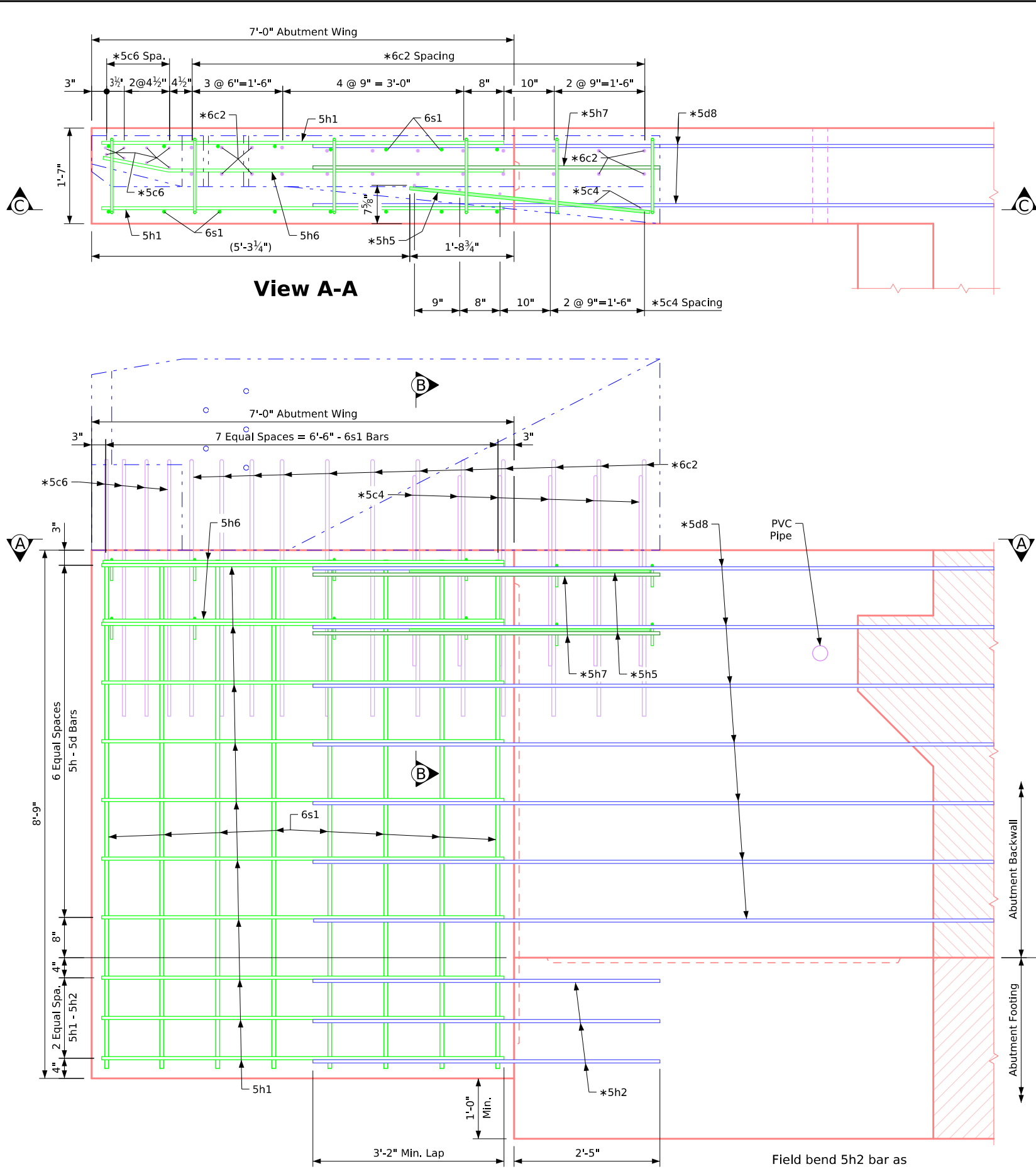
Section	Total
One Abutment Wing	3.6
Total (cu. yds.)	3.6

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

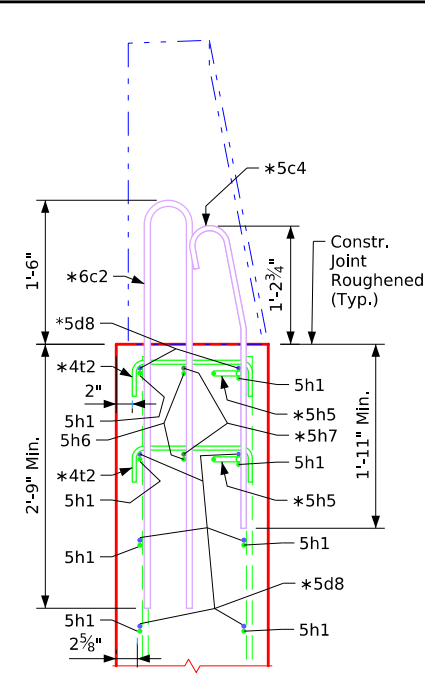
Stub Abutment Wing Details

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
Revised 06-2025: Corrected vertical space type for 5h-5d Bars to 6 Equal Spaces in Abutment Wing-Elevation View (was 5 Equal Spaces).
MiscellaneousBridges.dgn - 2114 - This Sheet Re-Issued 11-2023. Sheet Format Update.



Section C-C Abutment Wing - Elevation

Field bend 5h2 bar as necessary to avoid pile in abutment wing.



Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.

See Barrier Rail End Section Sheet on Design Sheet No. ?? for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.

Reinforcing Bar List - One Abut. Wing					
Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		20	6'-8"	139
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	8'-5"	202
Epoxy Reinforcing Total Weight (lbs.)					355

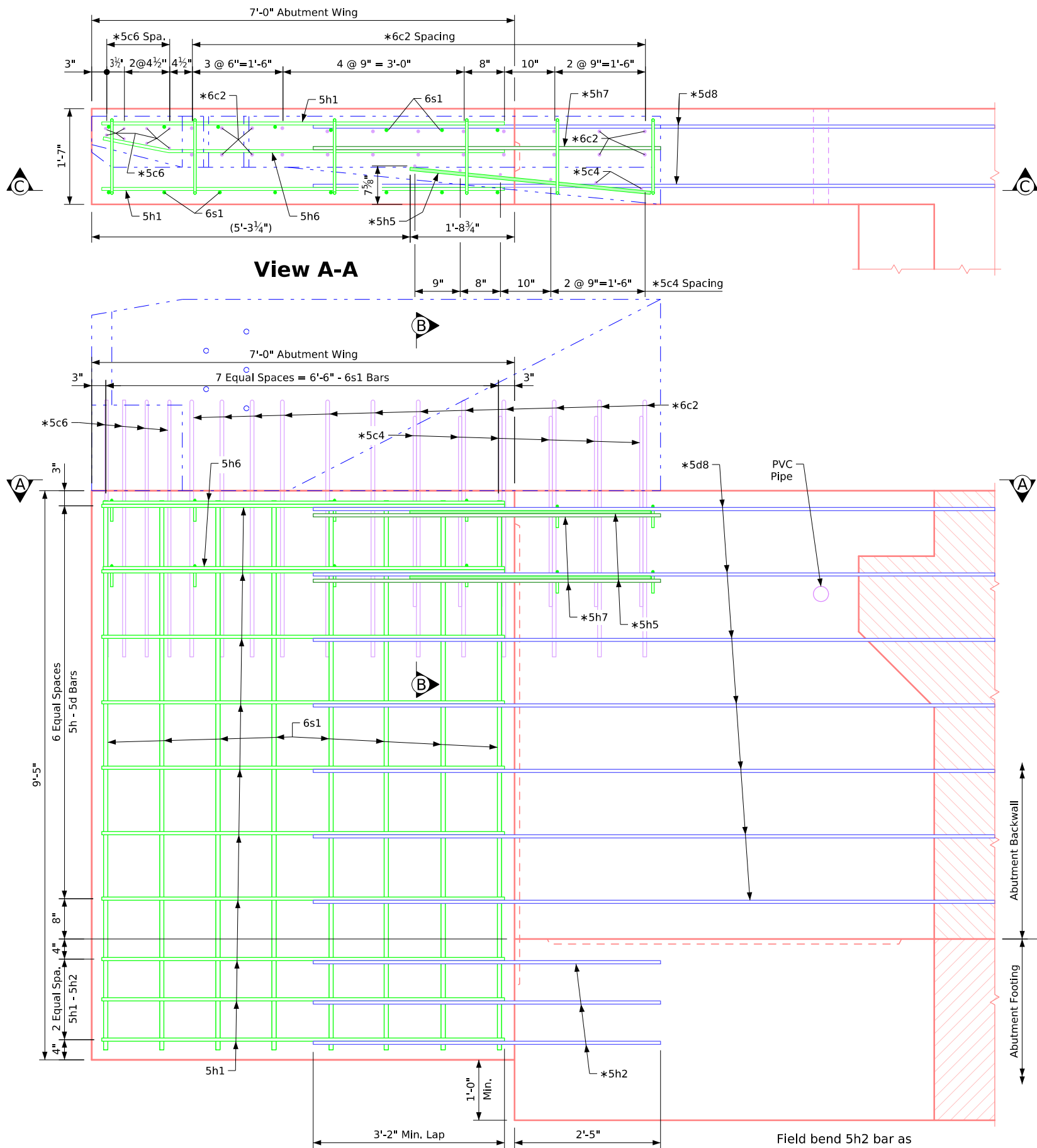
Concrete Placement Summary	
Section	Total
One Abutment Wing	3.6
Total (cu. yds.)	3.6

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

NOTE: "PC REBAR STAINLESS" level or "PC REBAR EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

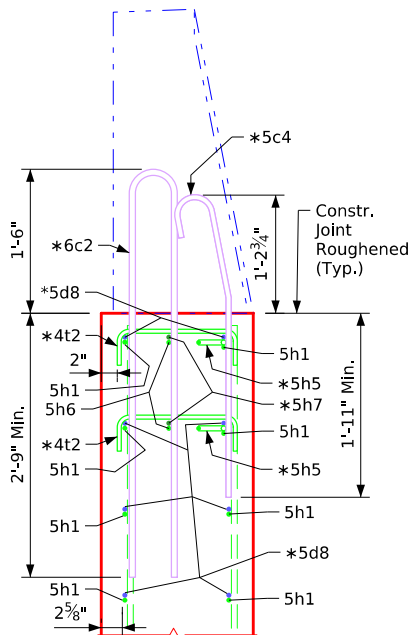
Integral Abutment Wing Details

Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
Revised 06-2025: Corrected vertical space type for 5h-5d Bars to 6 Equal Spaces in Abutment Wing-Elevation View. (Was 5 Equal Spaces).
MiscellaneousBridges.dgn - 2114-S - This Sheet Re-Issued 11-2023. Sheet Format Update.



Section C-C Abutment Wing - Elevation

Field bend 5h2 bar as necessary to avoid pile in abutment wing.



Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.

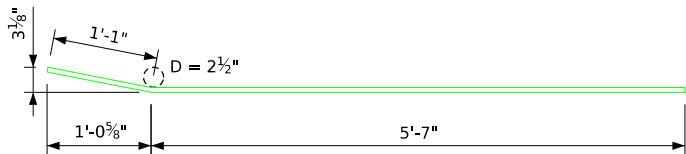
See Barrier Rail End Section Sheet on Design Sheet No. ?? for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		20	6'-8"	139
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	9'-1"	218

Epoxy Reinforcing Total Weight (lbs.) 371



Bent Bar Details

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

Concrete Placement Summary

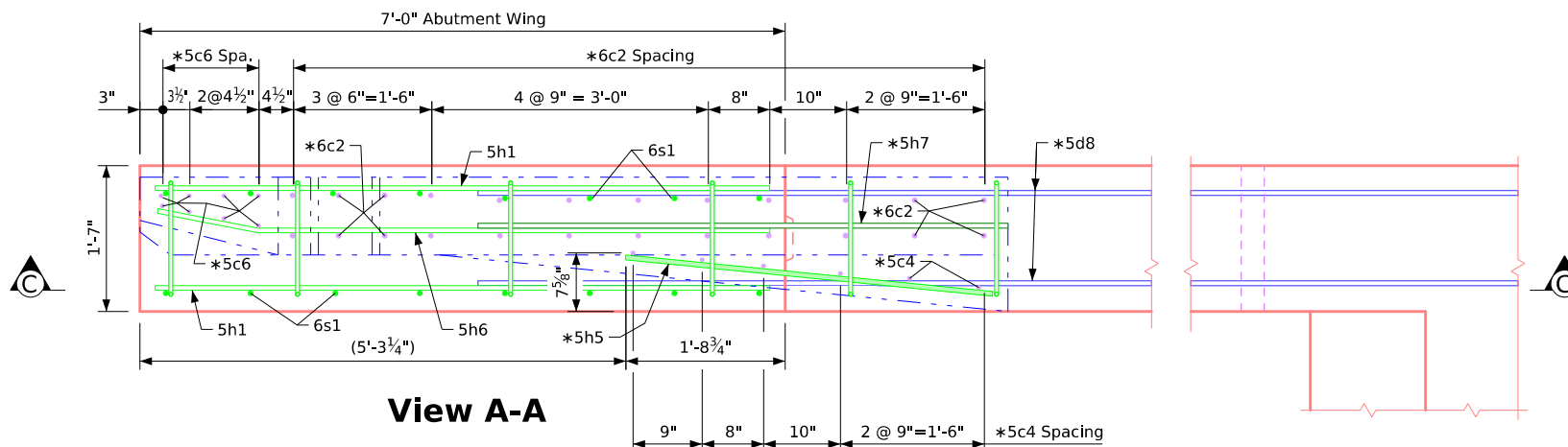
Section	Total
One Abutment Wing	3.9
Total (cu. yds.)	3.9

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

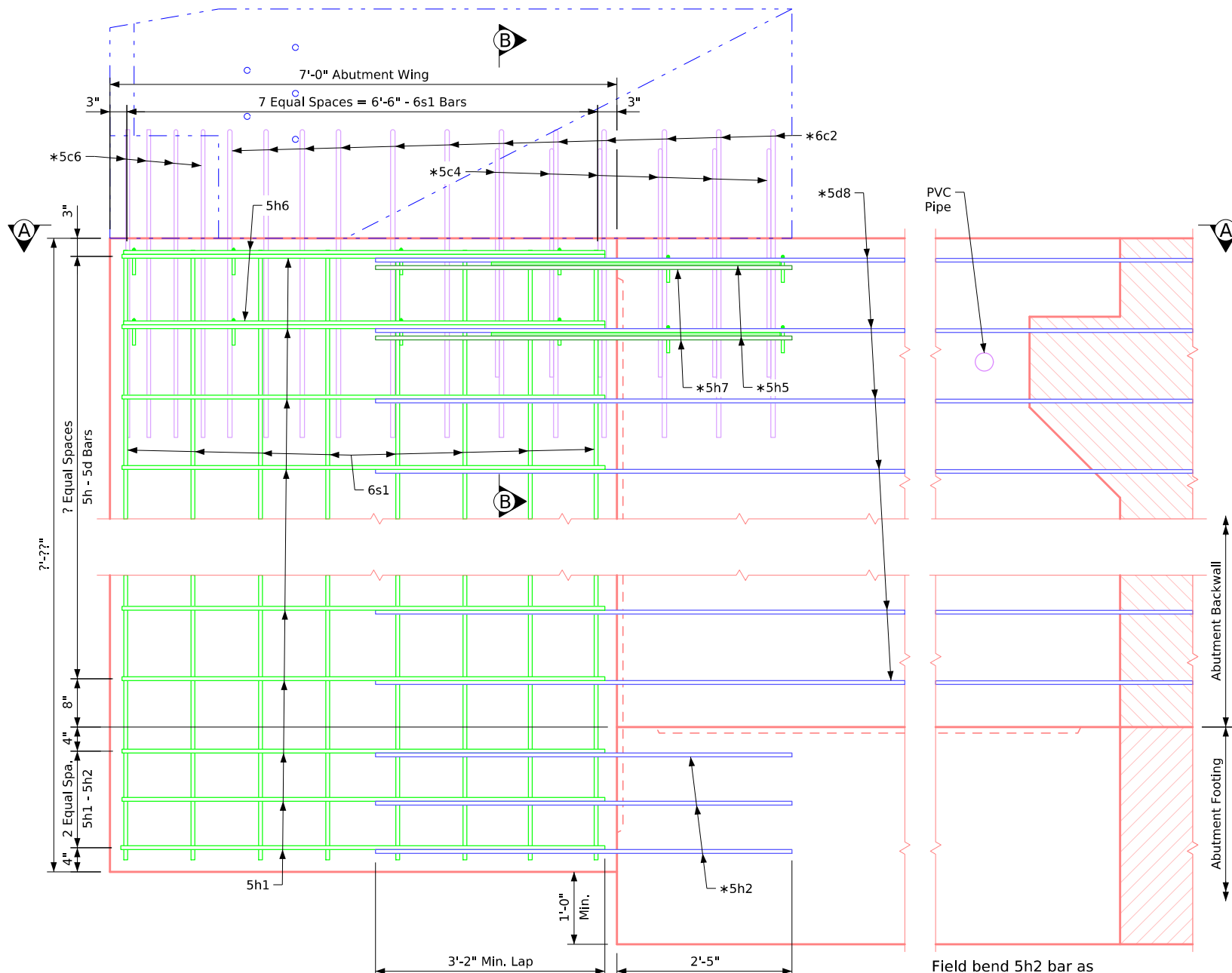
NOTE: "PC REBAR STAINLESS" level or "PC REBAR EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Stub Abutment Wing Details

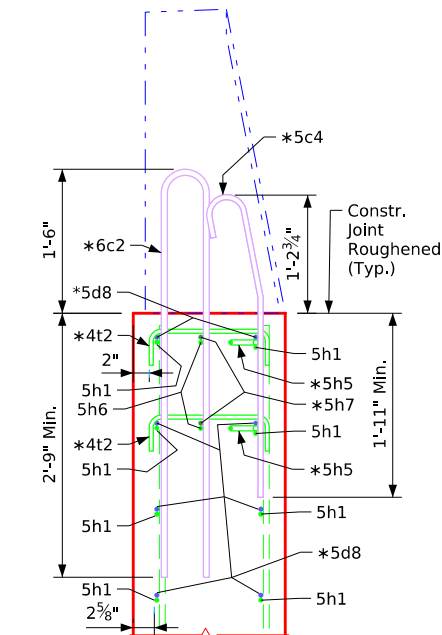
Revised 08-2024: Removed improperly placed bar label 6c1 in "Section B-B" details.
 Revised 06-2025: Changed 5h6 bar length and quantity (was 6'-0" and 3 bars). Updated
 MiscellaneousBridges.dgn - 2115 - This Sheet Re-Issued 11-2023. Sheet Format Updated



View A-A



Section C-C Abutment Wing - Elevation

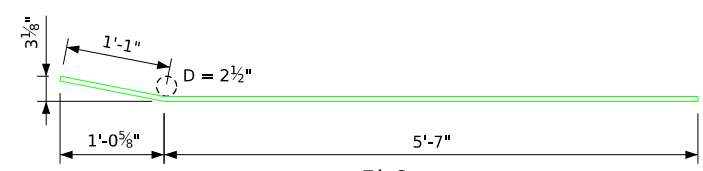


Section B-B

*Barrier rail end section bars to be placed with abutment wing and abutment.




See Barrier Rail End Section Sheet
on Design Sheet No. ?? for details of
reinforcing bars 6c2, 5c4, 5c6 and
4t2.

See Abutment Details Sheet on Design Sheet No. ?? for details of reinforcing bars 5d, 5h2, 5h5 and 5h7.



Bent Bar Details

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

Reinforcing Bar List - One Abut. Wing					
Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		???	6'-8"	???
5h6	Horizontal Wingwall		2	6'-8"	14
6s1	Vertical Both Faces		16	???	???
Epoxy Reinforcing Total Weight (lbs.)					???

The diagram illustrates the dimensions for a bent bar assembly. The bar is bent at an angle. The dimensions are as follows:

- Vertical dimension on the left: $3\frac{1}{8}"$
- Horizontal dimension for the bent section: $1'-1\frac{1}{2}"$
- Pin diameter: $D = 2\frac{1}{2}"$
- Horizontal dimension for the straight section: $1'-0\frac{5}{8}"$
- Total horizontal dimension: $5'-7"$
- Label for the straight section: 5h6

Bent Bar Details

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

Concrete Placement Summary	
Section	Total
One Abutment Wing (0.4105 Cu. Yd. Per Foot Depth)	???
Total (cu. yds.)	???

Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

NOTE TO DESIGNER: Abutment Wing Details For Welded Girder Bridges Shall Require Individual Design.

Abutment Wing Details

[illegible]

A diagram of a spiral welded or seamless steel pipe. It shows a cross-section of the pipe with a vertical dimension line on the left labeled 'K' representing the wall thickness. On the right side, there are two concentric circles. The outer circle is labeled 'R' for the outside radius, and the inner circle is labeled 'r' for the inside radius. The pipe is shown in a perspective view, with the top and bottom edges visible.

Note: shall be coated with deck epoxy

⑦ The the the foll Set sho

16" \square 8 - $\frac{1}{2}$ " \varnothing Strands,
14" \square 8 - $\frac{1}{16}$ " \varnothing Strands
or 8 - $\frac{1}{2}$ " \varnothing Strands
with Total Initial
Prestress of 174k

1" Fillet (Typ.)
at Top of Pile

#7 Bars

K

K

K + $\frac{1}{4}$ "

K - $\frac{1}{4}$ "

2 $\frac{1}{2}$ "

2 $\frac{1}{2}$ "

100°

100°

⑦ The Contractor has the option to install the cap steel as dowels following the Dowel Setting Procedure notes shown on this sheet.

Technical drawings of square and round pile caps. The square pile cap (left) is 4'-2" square with 4 #8 bars. The round pile cap (right) is 6'-0" diameter with 4 #8 bars. Both are 1'-5" high and have a 1'-4" top flange. A note states: "Top of Pile Encasement #8 Bars x 4'-2"". A weight note states: "Weight of Cap Steel=45 lb.".

Provide 2 - L $\frac{1}{8}$ " x $\frac{1}{8}$ " x $\frac{1}{8}$ "
Punched to Hold Spiral

#4 bars

20"

For HP14x73
& HP14x89

16"

For HP12x53

16"

For HP10x42
& HP10x57

2 1/2"

2 1/2"

1 1/2"

20"

24"

For HP14x73
& HP14x89

20"

For HP12x53

20"

For HP10x42
& HP10x57

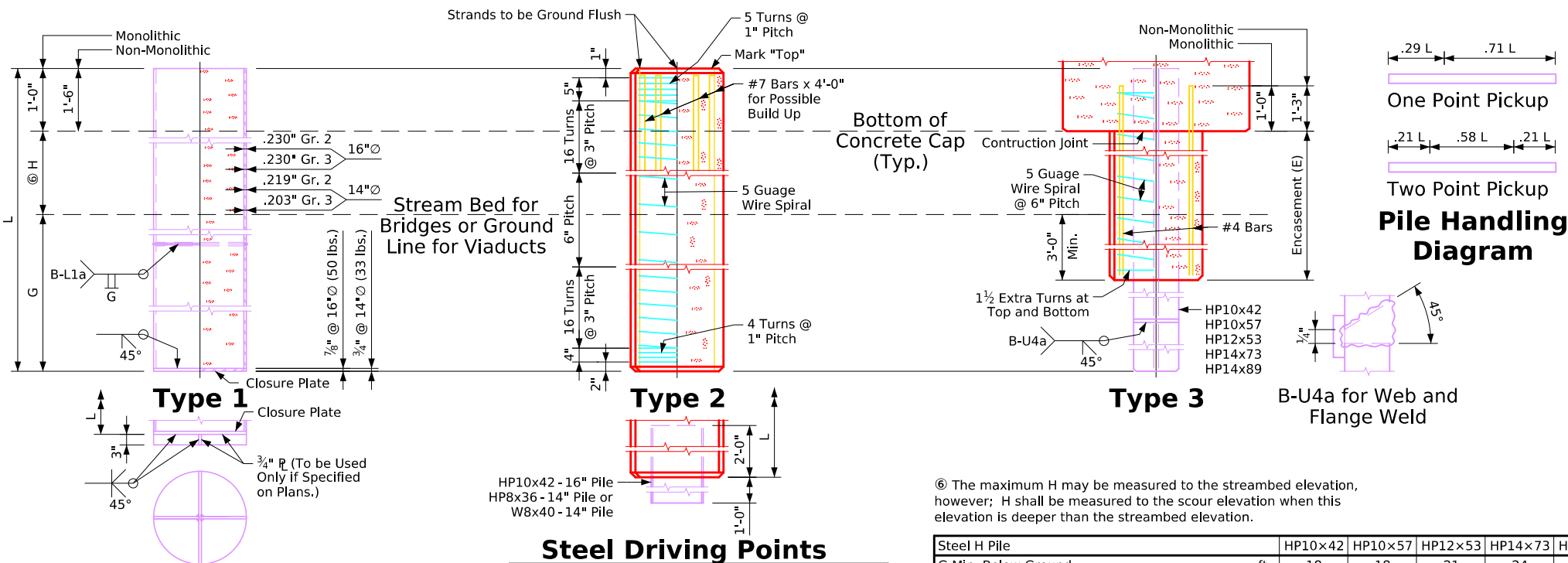
2"

Cl.

5 Ga. Spiral
@ 6" Pitch

#4 bars

Permissible Alternate
Encasement



K Dimension	in	140		160	
G Min. Below Ground	ft	24		27	
Ⓔ H Max. Above Ground	ft	18		22	
Shell ASTM A-252		Gr. 2	Gr. 3	Gr. 2	Gr. 3
Concrete (L=40')	cy	1.49	1.49	1.95	1.95
Concrete 1' Change	cy	0.0372	0.0373	0.0488	0.0488
Ⓐ Wt. of Shell (L=40')	lb	1325	1231	1600	1600
Wt. of Shell 1' Change	lb	32.26	29.94	38.77	38.77
f _c	ksi	4.0	4.0	4.0	4.0
Ⓔ Nominal Resistance P _n	kips	119	119	137	137

Strand Strength		270k	
K Dimension	in	14□	16□
G Min. Below Ground	ft	24	27
⑥ H Max. Above Ground	ft	18	22
Concrete (L=40')	cy	2.01	2.62
Concrete 1' Change	cy	0.050	0.066
② Reinforcing (L=40")	lb	232	280
Reinforcing 1' Change	lb	3.93	5.10
Max. L 1 Pt. Pick-Up	ft	57	60
Max. L 2 Pt. Pick-Up	ft	82	86
f'c	ksi	5.0	5.0
⑤ Nominal Resistance Pn	kips	127	146
③ Initial Prestress	kips	174	231

Steel H Pile		HP10×42	HP10×57	HP12×53	HP14×73	HP14×89	
G Min. Below Ground		ft	18	18	21	24	24
⑥ H Max. Above Ground W/ Monolithic		ft	19	19	23	28	29
⑥ H Max. Above Ground W/ Non-Monolithic		ft	15	16	20	25	26
Square	Concrete (E=18')	cy	1.12	1.10	1.41	1.74	1.72
	Concrete 1' Change	cy	0.062	0.061	0.078	0.097	0.096
	④ Reinforcing (E=18')	lb	96	96	99	103	103
	④ Reinforcing 1' Change	lb	4.98	4.98	5.13	5.28	5.28
Round	Concrete (E=18')	cy	1.40	1.38	2.02	3.17	3.15
	Concrete 1' Change	cy	0.078	0.076	0.112	0.176	0.175
	④ Reinforcing (E=18')	lb	97	97	102	110	110
	④ Reinforcing 1' Change	lb	5.02	5.02	5.26	5.62	5.62
⑤ Nominal Resistance Pn		kips	154	208	192	265	324
Pc = 4.0 ksi							

Except as noted elsewhere, material, construction, driving and extensions or build ups when necessary shall be in accordance with Standard Specifications of the Iowa D.O.T. and current Supplemental Specifications and Special Provisions applicable.

Cap steel shall be as detailed on this sheet (D=Pin Diameter). It shall be used if pile embedment is less than 1'-6".

"Nominal resistance Pn", "G", and "H" as given in tables are recommended design values for ordinary conditions, but may be modified for special conditions on any given job.

Nominal resistance Pn shown are for friction resistance except for Type 3 piling where the resistance values shown could be either friction or point resistance.

Wire spiral shall conform to ASTM A1064 Grade 70.

Shell thicknesses shown are minimum requirements. The method of driving steel shell piles shall be adapted to the type and thickness of shell specified. Any shells which have been improperly driven, broken or are otherwise defective shall be removed and replaced by the bridge Contractor.

All cast in place piles shall have a closure plate. Driving points shall be used if specified on the plans.

Except as otherwise noted all exposed corners 90° or sharper shall be filleted $\frac{3}{4}$ ".
Driving points for prestressed piles, if called for on the plans, shall be as detailed.
Heads of prestressed piles to be finished smooth and normal to axis of pile.

The plans shall designate the size of pile to be used. They shall also specify the type, either Type 1, Type 2, or Type 3. If the option of Type 1 or 2 is given on the plans, the Contractor shall choose the type to be used. If Type 3 is specified, Type 3 shall be used, but the Contractor may choose the shape of the encasement. It should be kept in mind that for a given size and resistance value, length may vary with the shape (square or round).

Piles shall be bid designating the size, type and length.

Type 1 piling will be bid per linear foot of pile.

Type 2 piling will be bid per linear foot of pile.

Type 3 piling will be bid per linear foot of pile and linear foot of encasement. Price bid for encasement shall be full payment for necessary excavation and for furnishing and placing all material.

If cap steel is required for the prestressed piles, the #8 deformed bars are to be set as dowels into the piles with polymer grout in accordance with Article 2301.03, E, of the Standard Specifications or by the following procedure.

A - Drill hole approximately twice the diameter of the dowel bar and to the depth indicated.

B - Fill hole with water and allow to stand long enough to thoroughly saturate the surrounding concrete (about four hours).

C - Blow out all free water and fill hole 2/3 full of mortar.

D - Insert dowel by driving, if necessary, and manipulate or tap with a hammer to consolidate mortar and secure complete embedment.

E - Add more mortar, if necessary, to fill hole.

F - Mortar shall consist of equal parts portland cement and sand with just enough water to make a workable mix.

Approved By:



Bridge Engineer

LRFD Trestle Pile Bents - P10L

Latest Revision
Date: 06-2025