

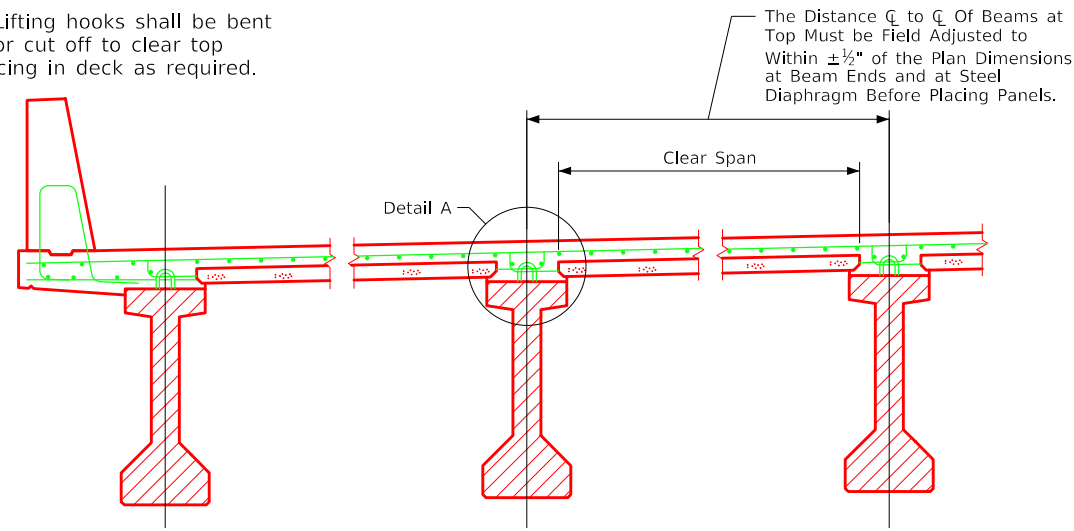
Index of Miscellaneous Standards

Standard	Description
1037As1	'A' - 'D' Beam Precast Prestressed Concrete Deck Panel (1 of 2)
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)
1037C	Precast Prestressed Concrete Deck Panel
1046	12" Prestressed Concrete Foundation Pile
1049	Temporary Barrier Rail - F Shape Concrete - One Way Traffic (Void 08-2023)
1050	Temporary Barrier Rail - F Shape - Two Way Traffic (Void 08-2023)
1050A	Temporary Barrier Rail - F Shape Concrete - Bridge Floor Overlay Two Way Traffic (Void 08-2023)
1054	Aesthetic Deck Drain
1056	Steel H14x73 Temporary Barrier Rail Standards For Two Way Traffic (Void 08-2023)
1058	Steel H14x73 Temporary Barrier Rail Standards For One Way Traffic (Void 08-2023)
1065	Beam Camber & Deck Thickness Details
1066	Deck Haunch Data Details
1067	BNSF & UPRR Railroad General Notes & Shoring Details
1068	Paving Notch Replacement Details
1090	Floor Support Beam Details
1090A	Floor Support Beam Details
1091	Floor Support Beam Layout Example
2110	"A" Beam Integral Abutment Wing Details
2111	"B" & "BTB" Beam Integral Abutment Wing Details
2112	"C" & "BTC" Beam Integral Abutment Wing Details
2112-S	"C" & "BTC" Beam Stub Abutment Wing Details
2113	"D" & "BTD" Beam Integral Abutment Wing Details
2113-S	"D" & "BTD" Beam Stub Abutment Wing Details
2114	"BTE" Beam Integral Abutment Wing Details
2114-S	"BTE" Beam Stub Abutment Wing Details
2115	Abutment Wing Details For Welded Girder & Non-standard Beams
P10L	LRFD Concrete And Steel Trestle Pile Bents

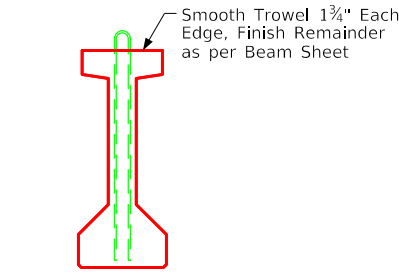
Index of Miscellaneous Standards

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.
 Issued 02-10.
 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.

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

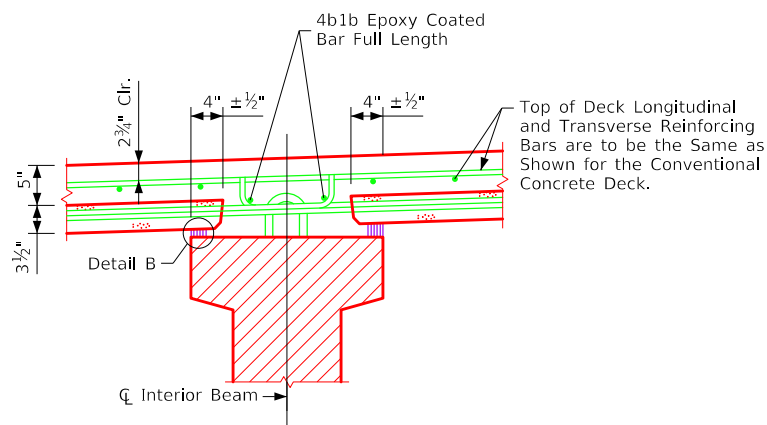


Typical Deck Section

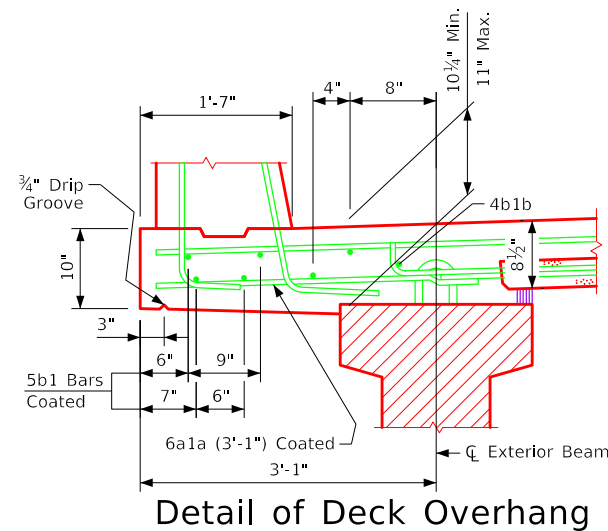


Beam Detail

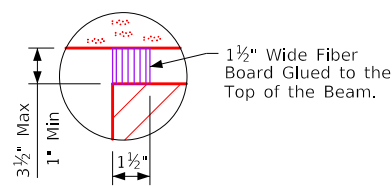
Note: Variation in haunch dimension is to be accomplished by varying the thickness of fiber board in order to secure a uniform deck thickness. A minimum cast-in-place deck thickness as shown in Detail A shall be maintained. The deck may be thickened when the maximum haunch shown is not sufficient to 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.



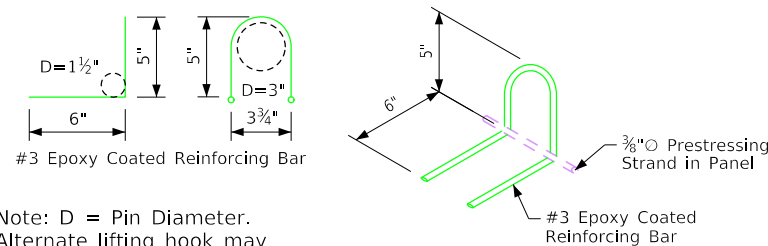
Detail A



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 } $\frac{1}{4}$ "
- Width } $\frac{1}{8}$ "
- Square ends (deviation from square) } $\frac{3}{8}$ "

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. Special care must be taken to remove all debris from under the ends of the plank. The plank surface shall be wet when cast-in-place concrete is placed on the plank.

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 $\frac{3}{8}$ " \odot 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.

#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 in 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 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:

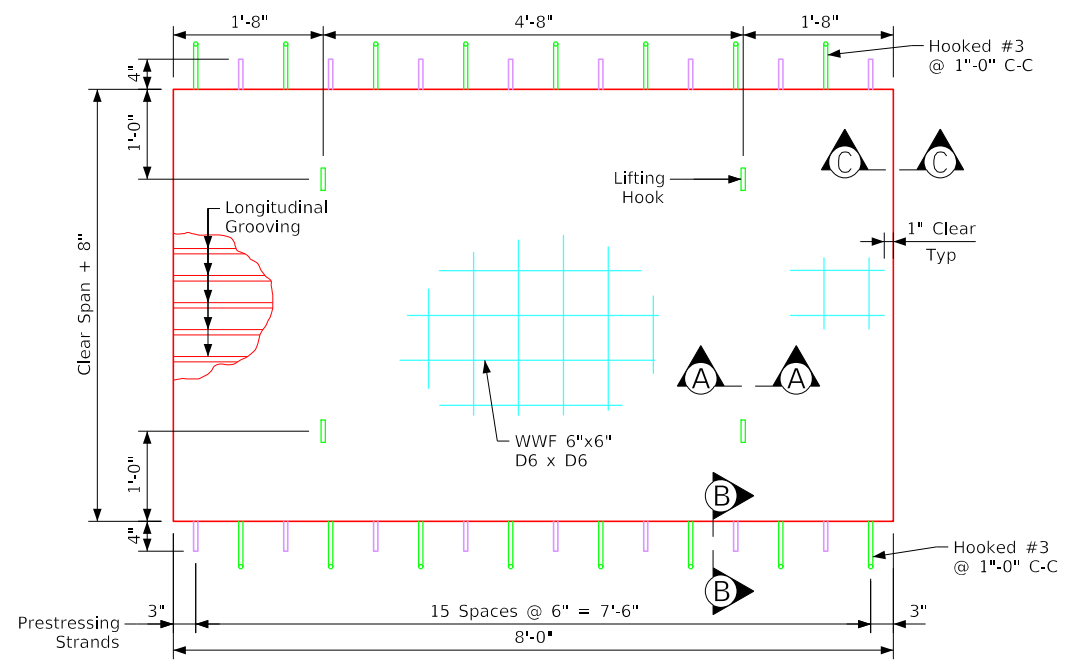
Design stresses for the following materials are in accordance with the AASHTO Standard Specifications for Highway Bridges, Series of 2017.

Reinforcing steel in accordance with Section 8, Grade 60.

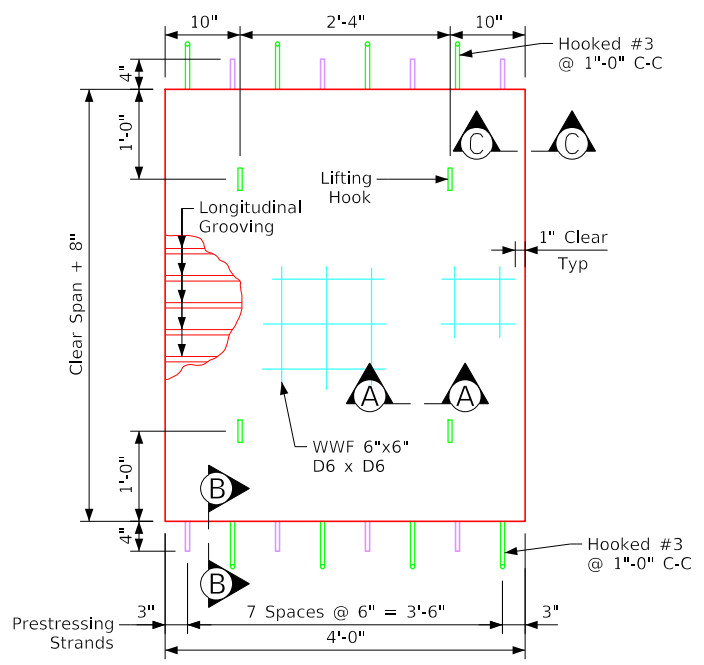
Concrete in accordance with Section 8, $f'c = 4.0$ KSI.

Precast Deck Panel Details

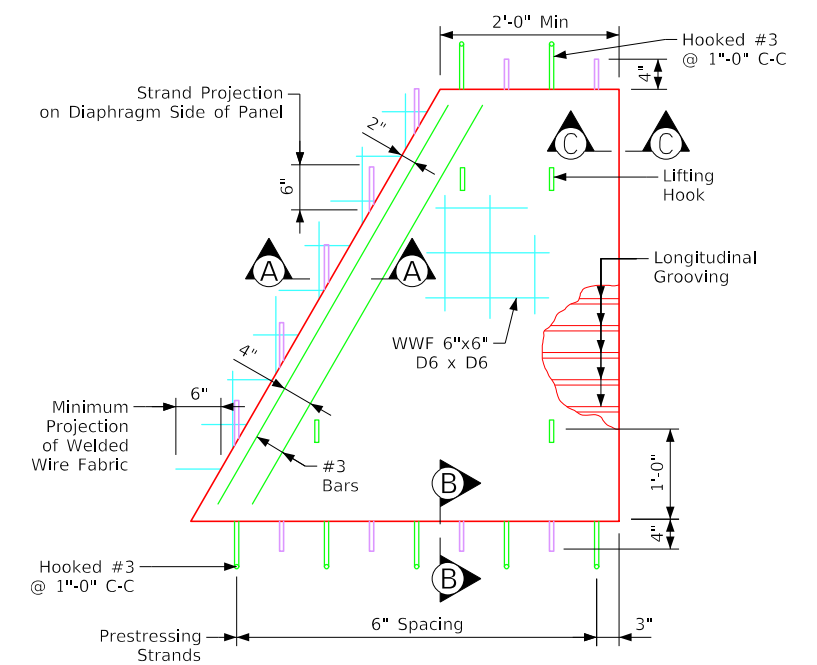
Revised 04-18: Moved Dimension Text In 8'-0" Deck Panel Detail. It Was Overlapped By Dimension Line.
 Redrawn 12-27-89.
 Miscellaneousbridges.dgn - 1037as2 - This Sheet Re-issued 11-2023 (was 1037 and 1037B). Sheet Format Update.



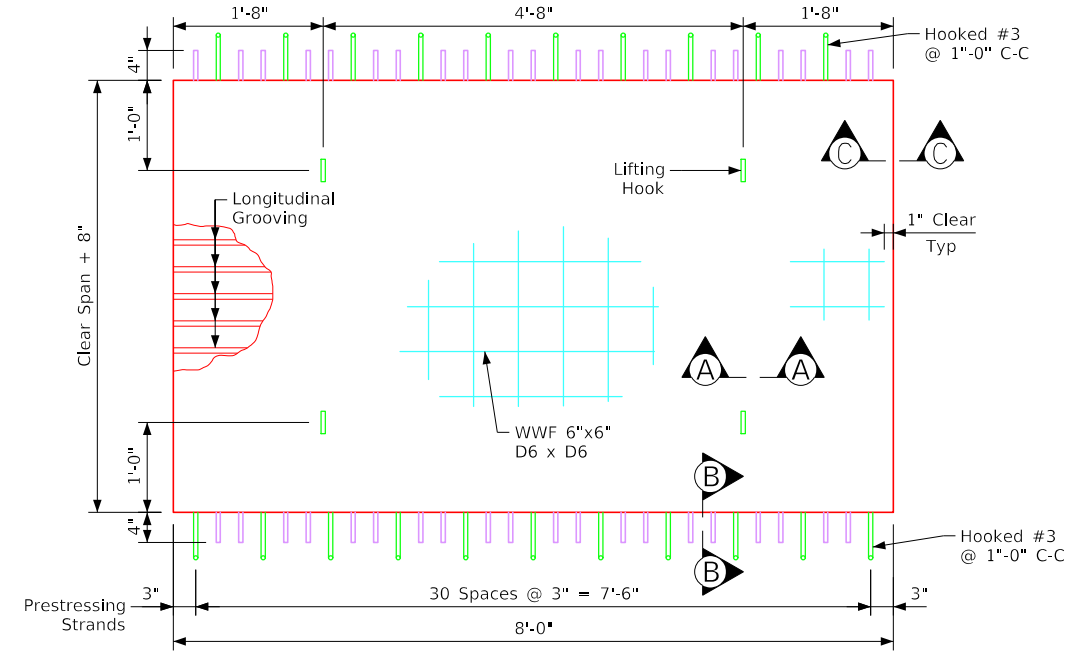
8'-0" Deck Panel
 Maximum Clear Span = 7'-0"



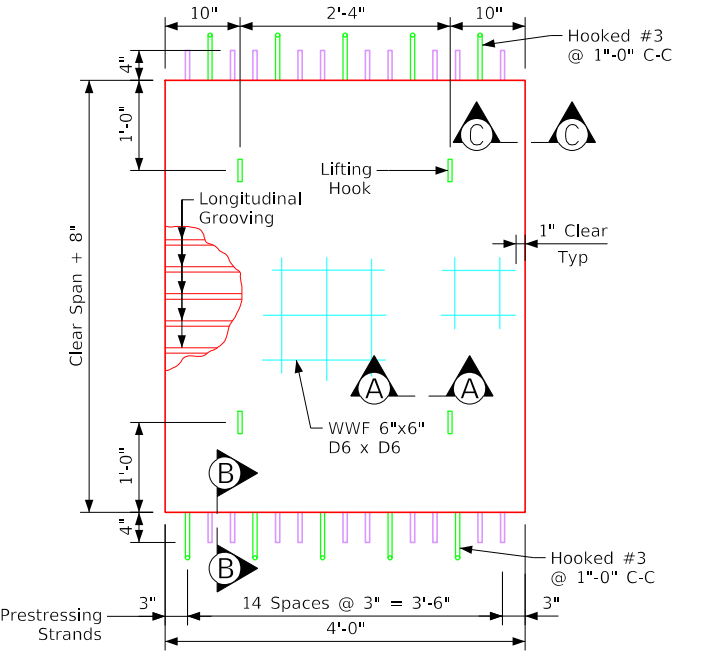
4'-0" Deck Panel
 Maximum Clear Span = 7'-0"



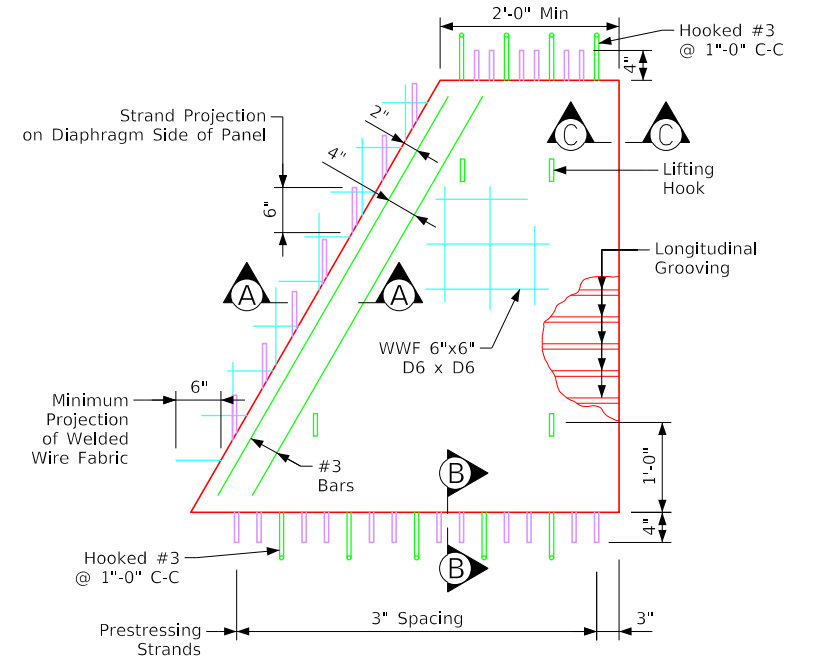
End Skew Deck Panel
 Maximum Clear Span = 7'-0"



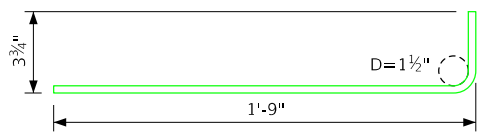
8'-0" Deck Panel
 Minimum Clear Span > 7'-0"
 Maximum Clear Span = 10'-0"



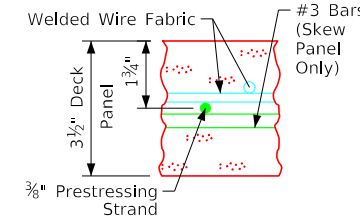
4'-0" Deck Panel
 Minimum Clear Span > 7'-0"
 Maximum Clear Span = 10'-0"



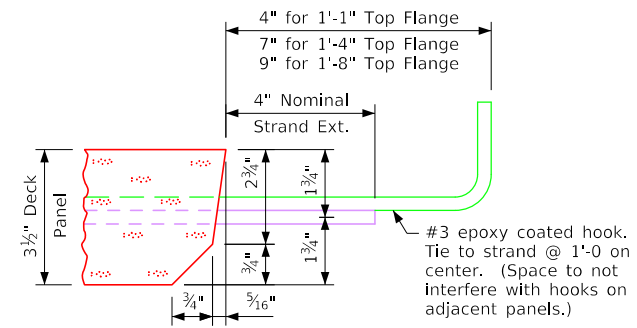
End Skew Deck Panel
 Minimum Clear Span > 7'-0"
 Maximum Clear Span = 10'-0"



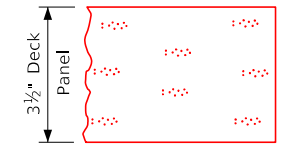
Hooked #3



Part Section A-A



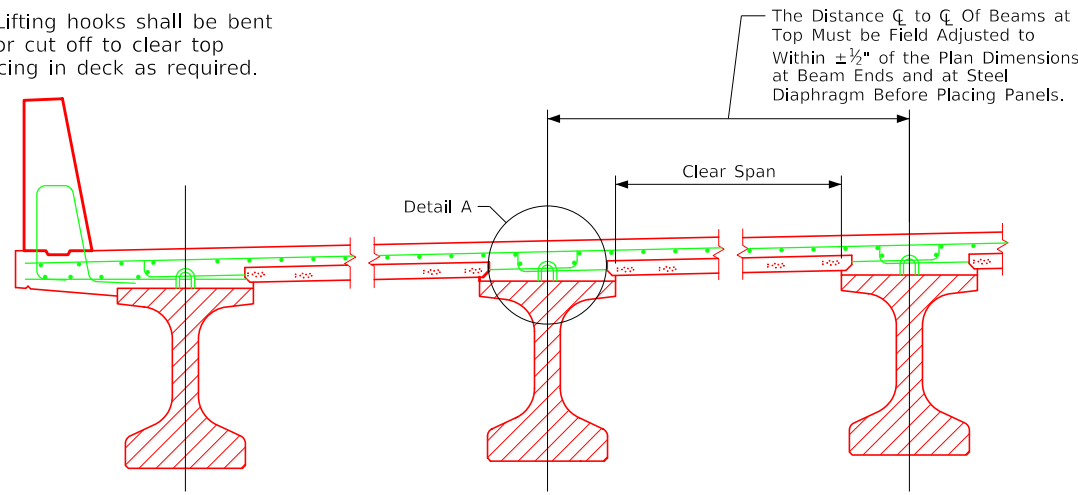
Part Section B-B



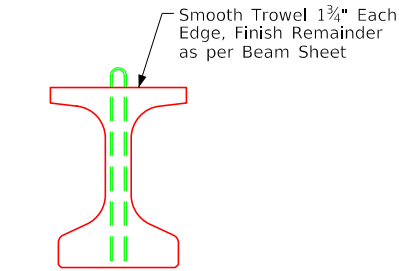
Part Section C-C

Precast Deck Panel Details

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



Typical Deck Section



Beam Detail

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.

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 } $\frac{1}{4}$ "
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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 $\frac{3}{16}$ ".

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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 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.

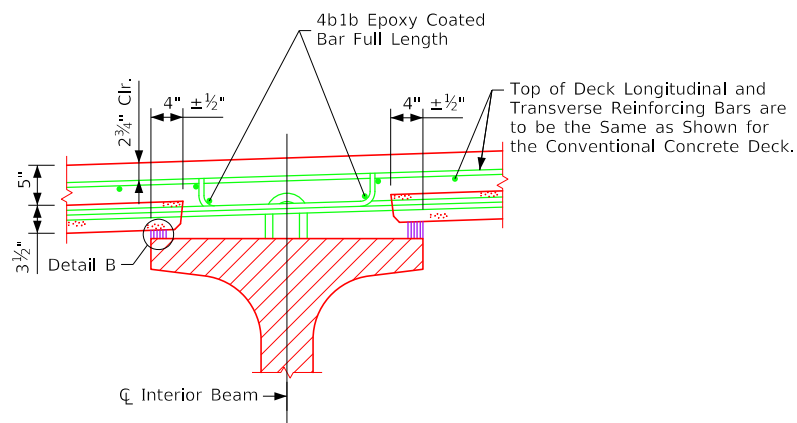
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Design Stresses:

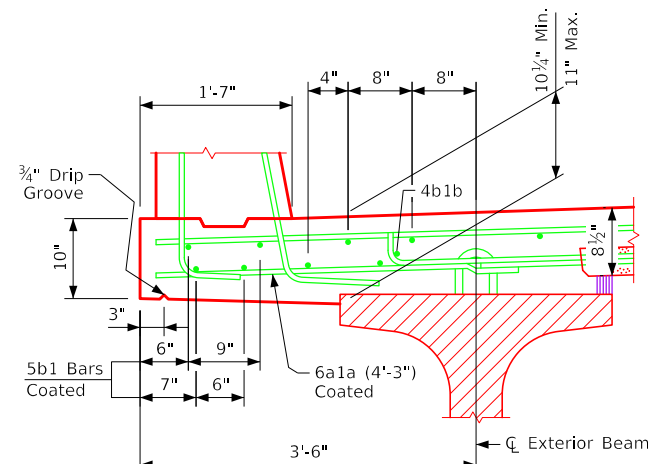
Design stresses for the following materials are in accordance with the AASHTO Standard Specifications for Highway Bridges, Series of 2017.

Reinforcing steel in accordance with Section 8, Grade 60.

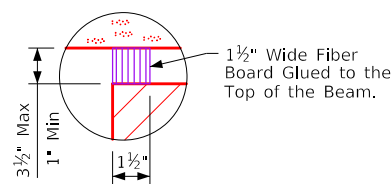
Concrete in accordance with Section 8, f'c = 4.0 KSI.



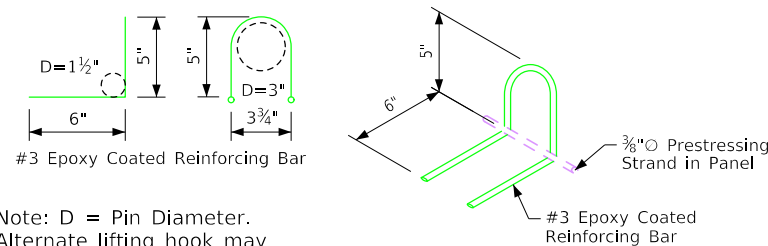
Detail A



Detail of Deck Overhang



Detail B



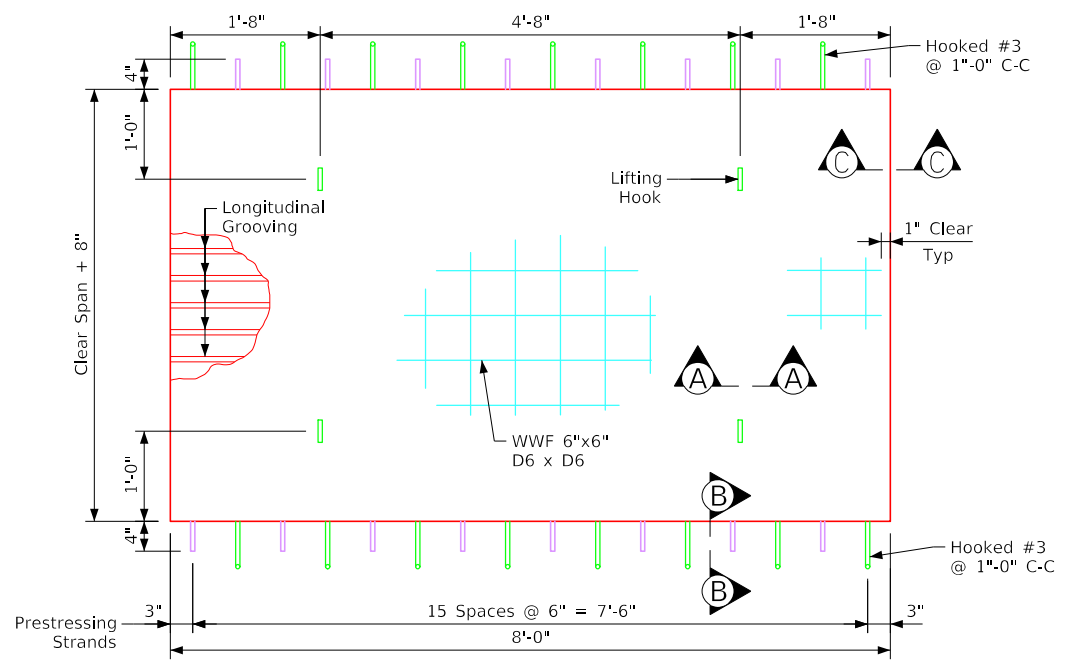
Note: D = Pin Diameter.
Alternate lifting hook may be substituted with the approval of the Engineer.

Lifting Hook Detail

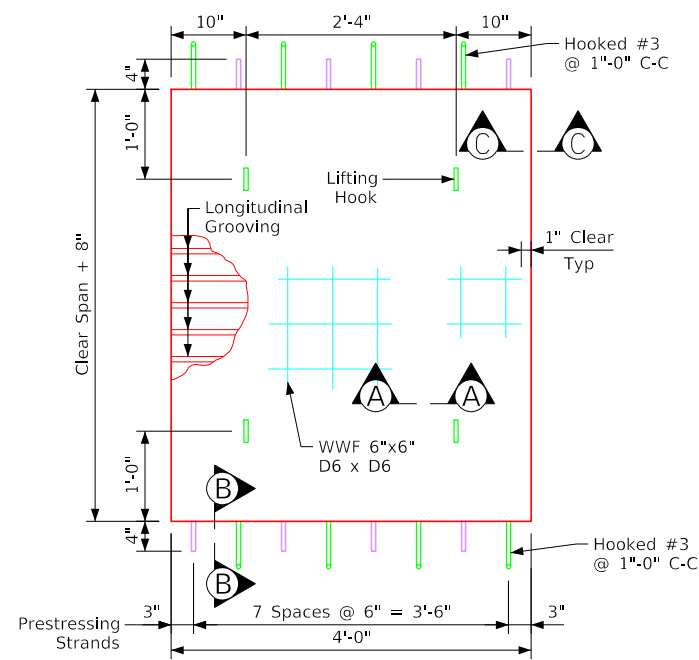
Precast Deck Panel Details

MiscellaneousBridges.dgn - 1037Bs1 - This Sheet Issued 11-2023.

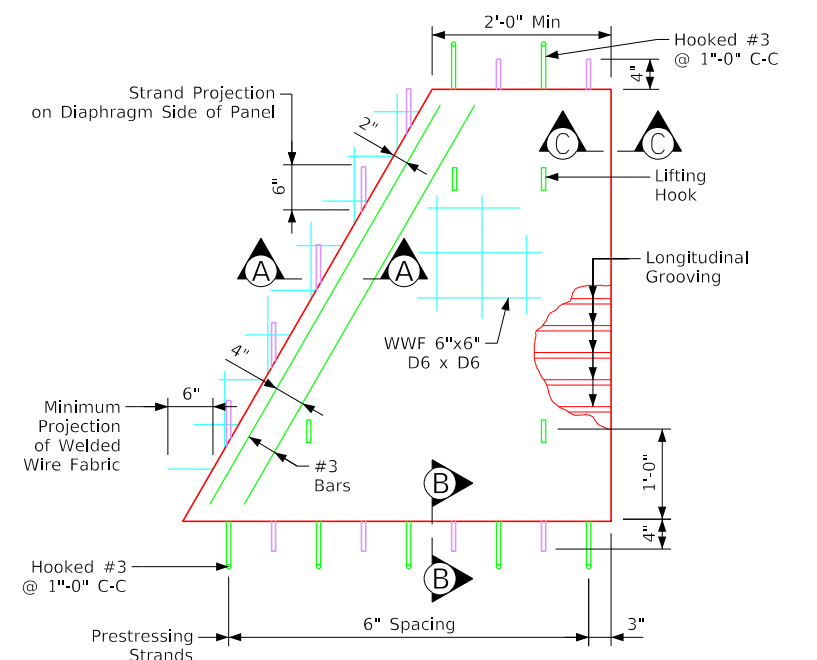
FILE NO.	ENGLISH	DESIGN TEAM	'BT' Beam Precast Prestressed Concrete Deck Panel (1 OF 2)	Standard Sheet 1037Bs1	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:27 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot.int.lan:PWMain\Documents\Highway\Bridges\Standards\Bridges\MiscellaneousBridges.dgn				



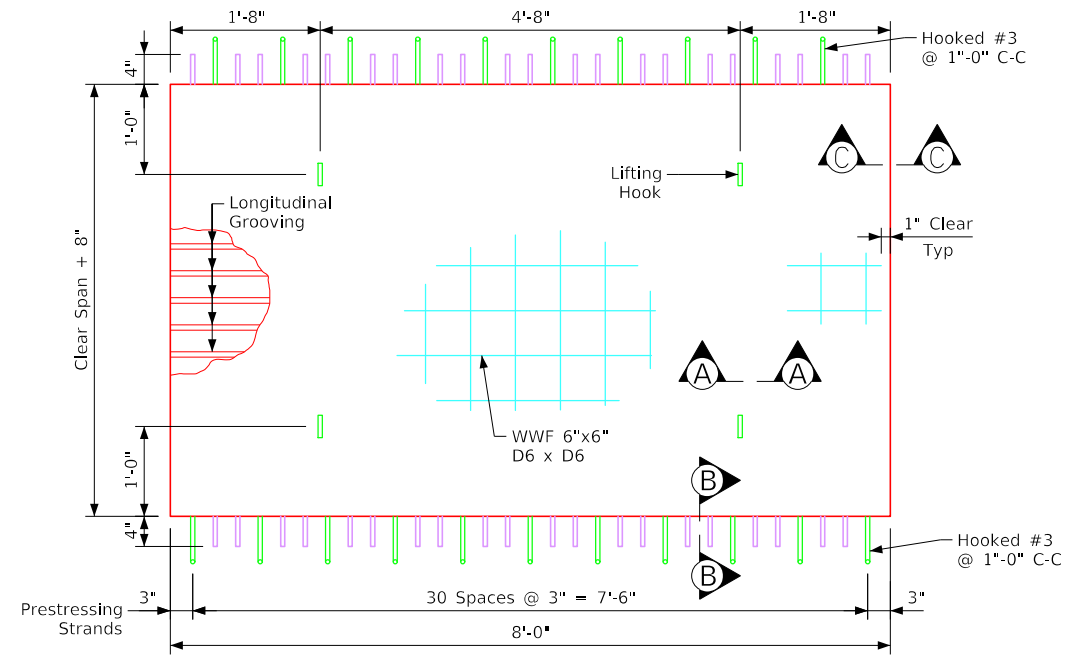
8'-0" Deck Panel
Maximum Clear Span = 7'-0"



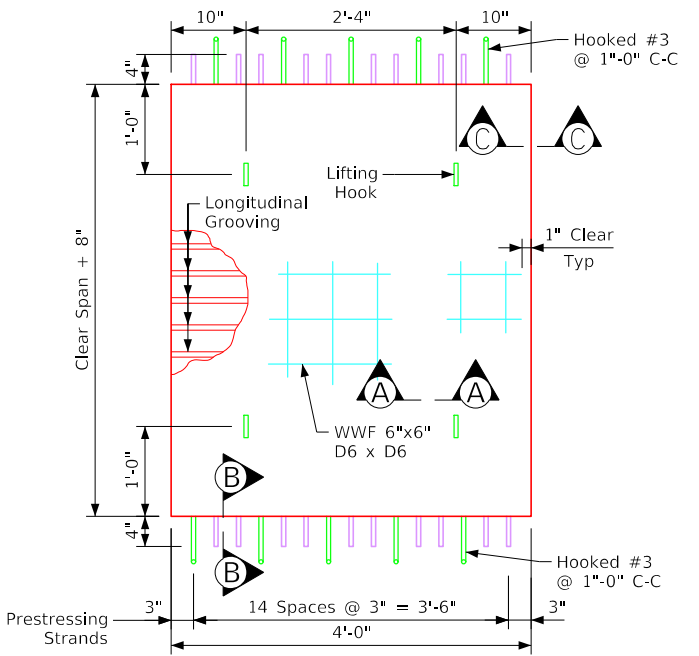
4'-0" Deck Panel
Maximum Clear Span = 7'-0"



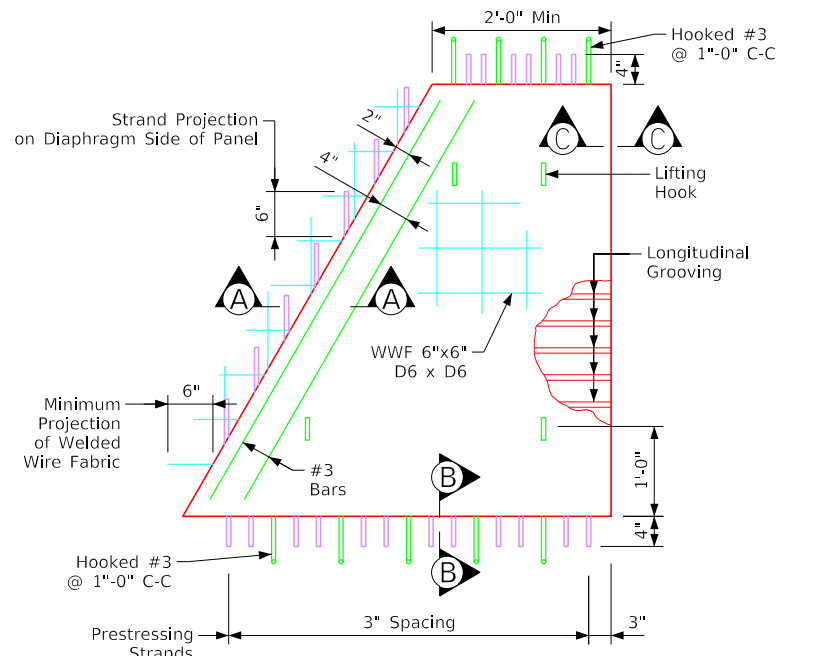
End Skew Deck Panel
Maximum Clear Span = 7'-0"



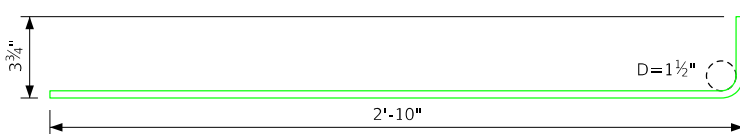
8'-0" Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"



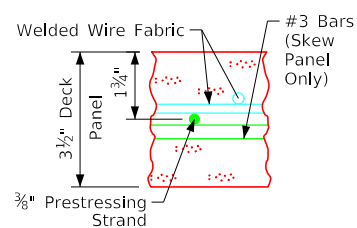
4'-0" Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"



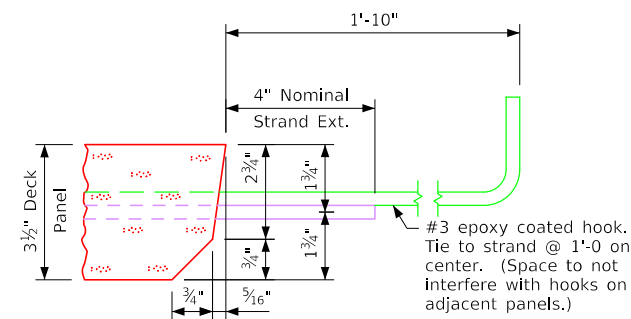
End Skew Deck Panel
Minimum Clear Span > 7'-0"
Maximum Clear Span = 10'-0"



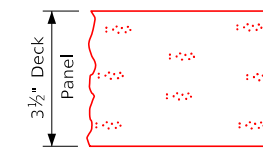
Hooked #3



Part Section A-A

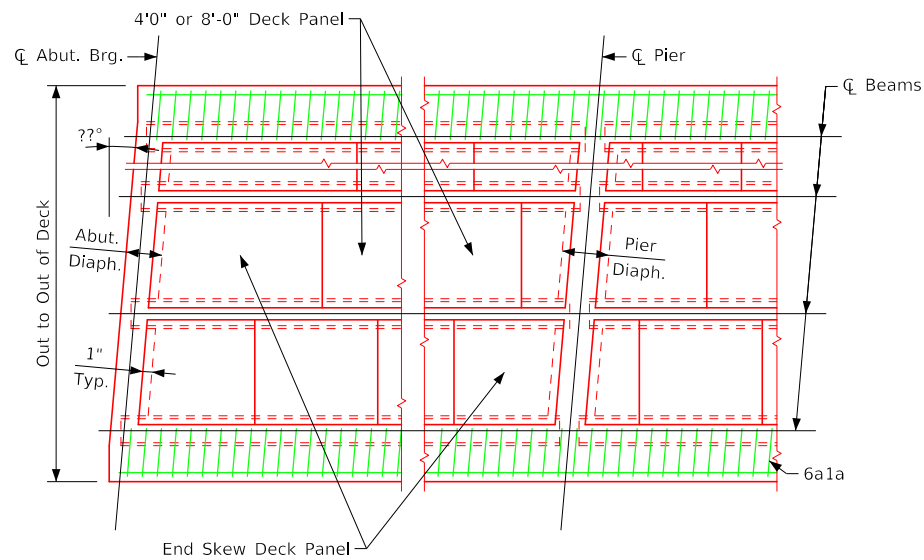


Part Section B-B

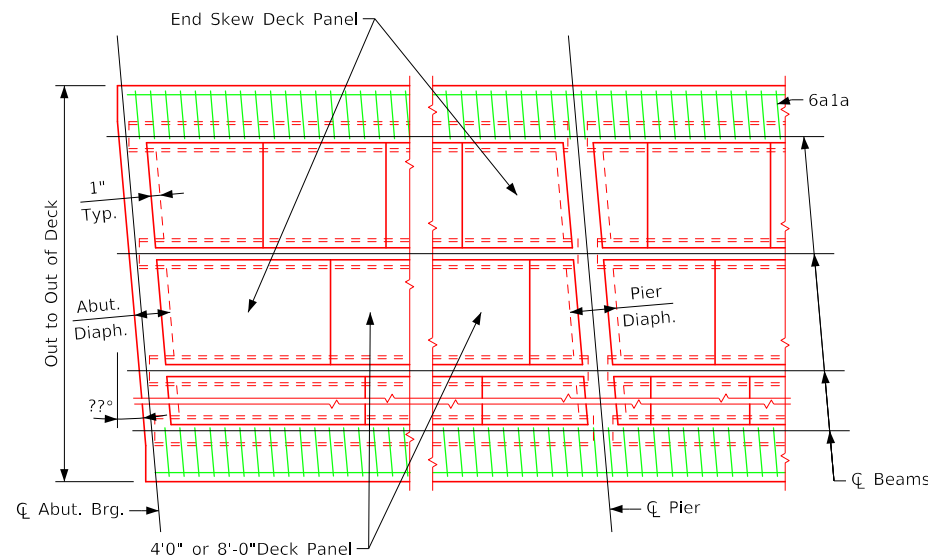


Part Section C-C

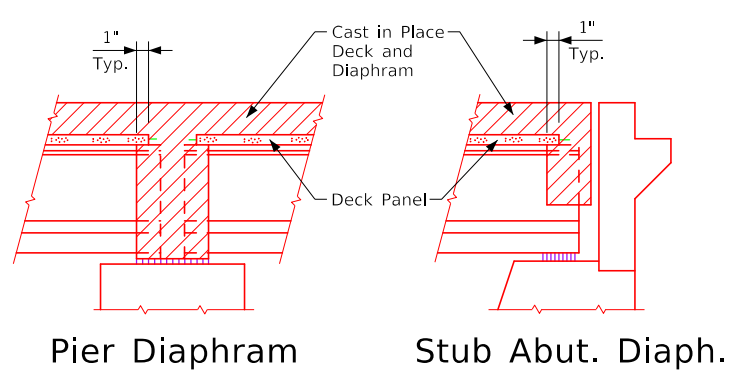
Precast Deck Panel Details



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')

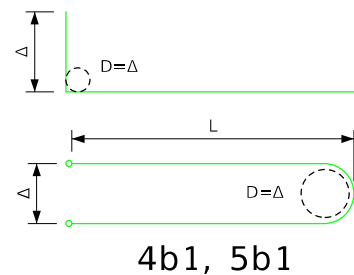


Note to Designer: Put on Superstructure Bar List Sheet.

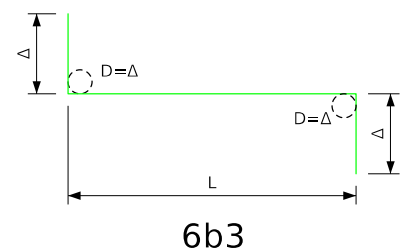
Note: If the precast prestressed concrete deck panels are to be used in the construction of the bridge deck in lieu of the conventional cast-in-place deck, the following adjustments to the Superstructure Epoxy Coated Reinforcing Steel shall be made.

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

4b1 or 5b1, 6b3 Dimension L			
PPC Beam Type	4b1	5b1	6b3
A	2'-11 3/4"		
B	3'-6 3/4"		
C	4'-0 3/4"		
D	4'-9 3/4"		
BTB		3'-4"	3'-3 1/2"
BTC		4'-1"	4'-0 1/2"
BTD		4'-10"	4'-9 1/2"
BTE		5'-7"	5'-6 1/2"



4b1, 5b1



6b3

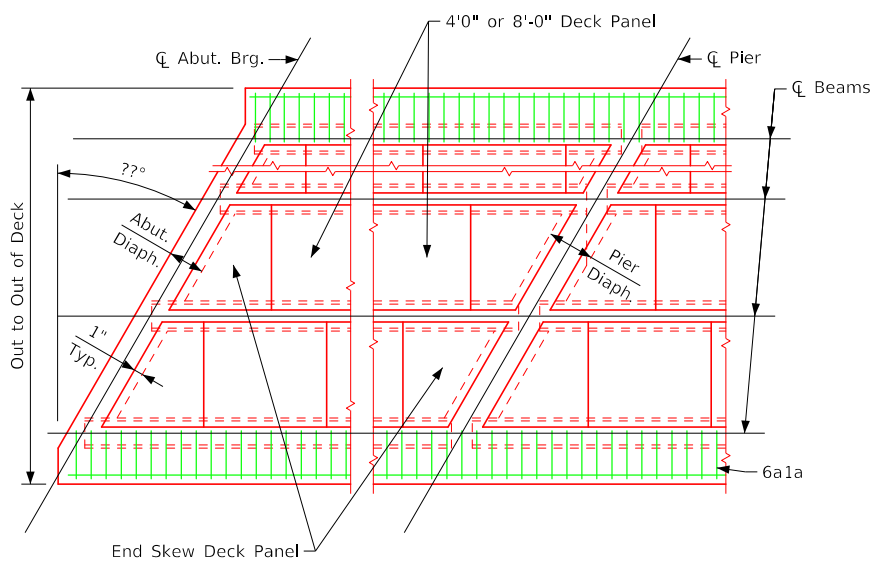
Note: Areas outside of panel sections are full depth cast-in-place deck and diaphragms. Alternate detail of using full depth cast-in-place deck at the skewed ends may be submitted for approval.

Note to Designer: Place This Note on Beam 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 4b1 or 5b1, 6b3 stirrups shown on this sheet shall be modified as shown on Design Sheet.

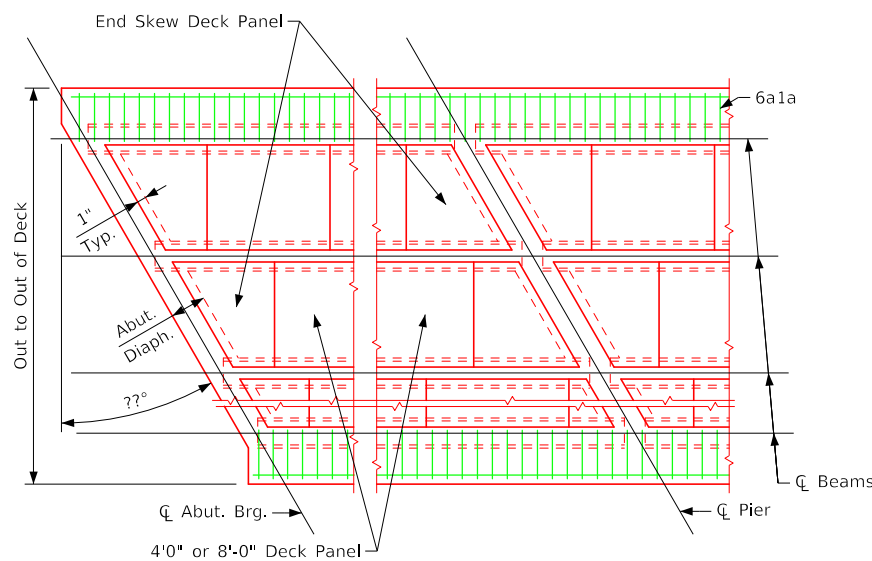
Stirrup 4b1 or 5b1, 6b3 Details

Note: Beam stirrup 4b1 or 5b1, 6b3 shall be modified as shown when deck panels are used.

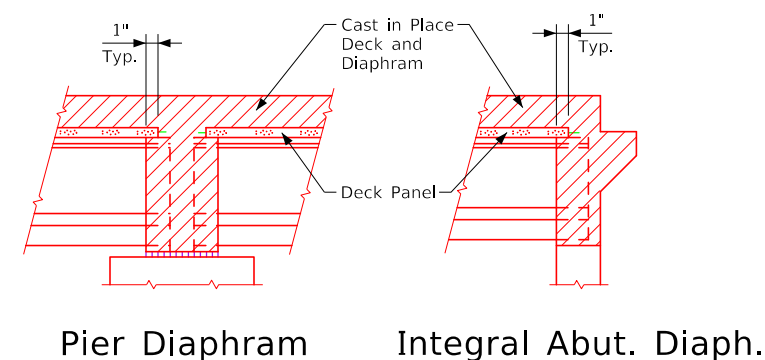
Δ = See Beam Sheets for additional Bent Bar Details.
Stirrup dimensions are out to out.



Deck Panel Location Part Plan
(For L.A. Skews 7°31' to 40°)



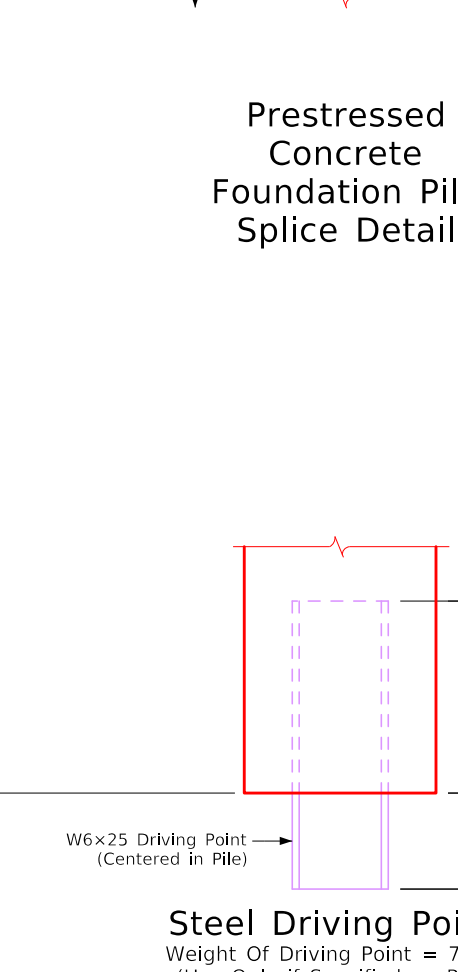
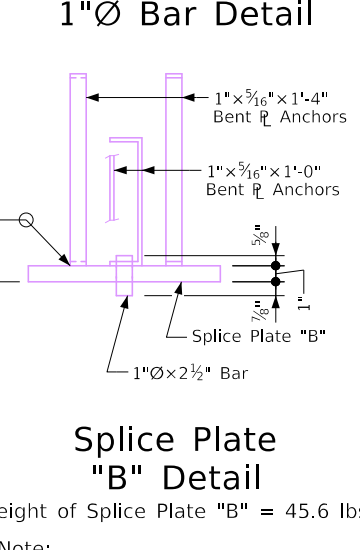
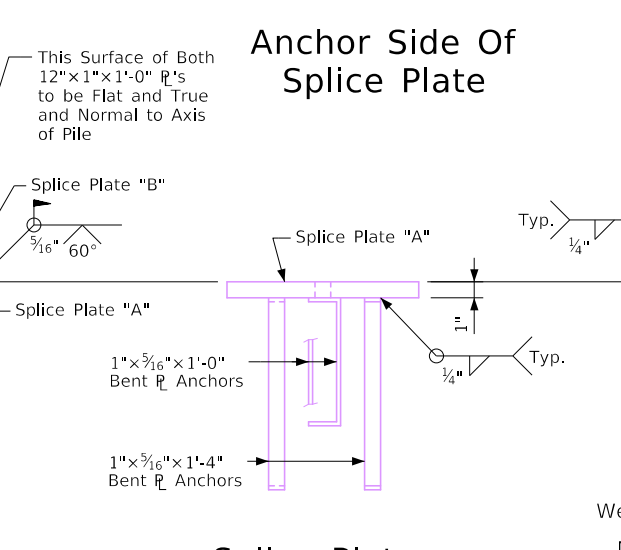
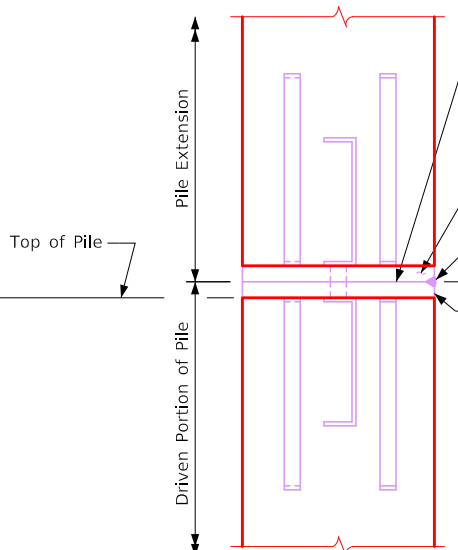
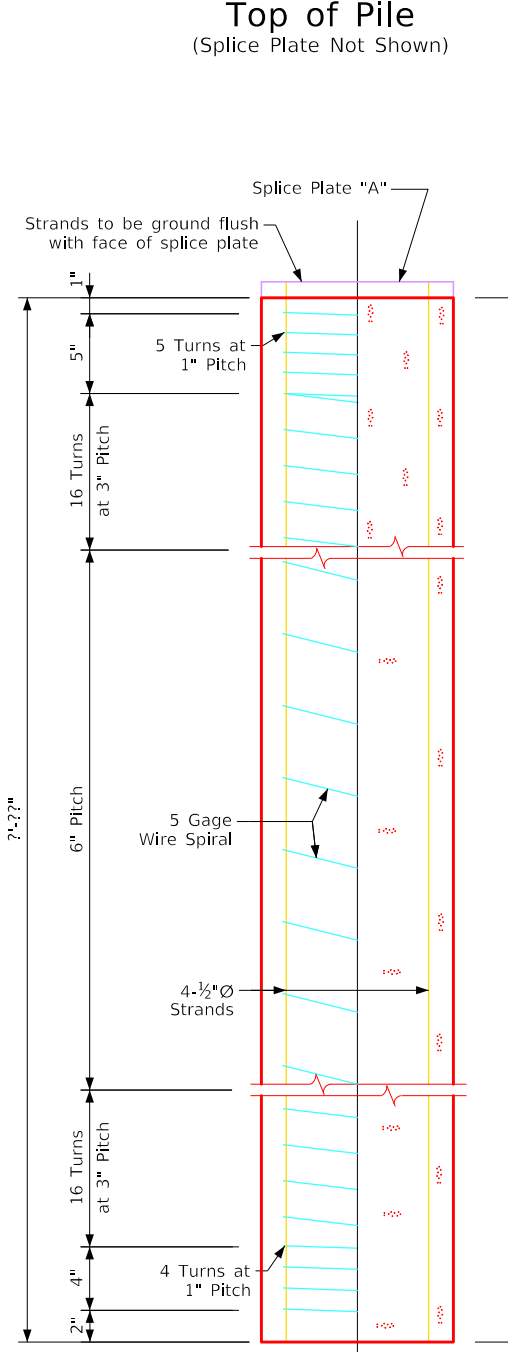
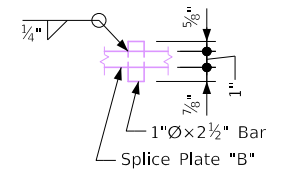
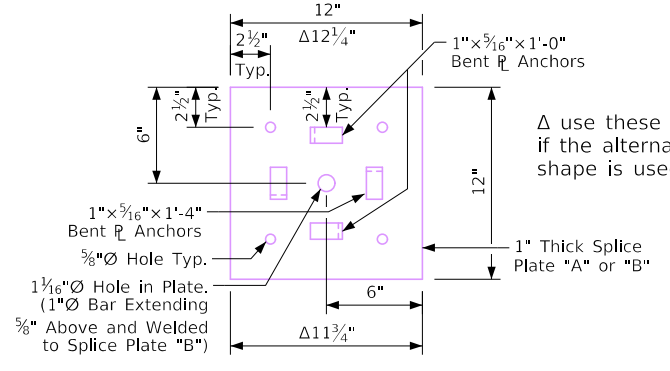
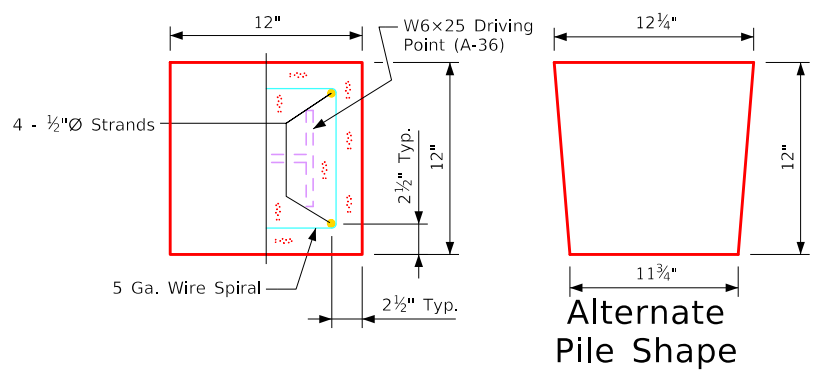
Deck Panel Location Part Plan
(For R.A. Skews 7°31' to 40°)



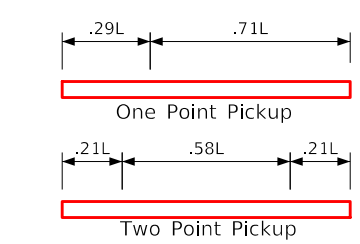
Precast Deck Panel Details

Revised: 5-99 - Reinforcing bar list changed.
Redrawn 12-27-89.
MiscellaneousBridges.dgn - 1037As1 - This Sheet Re-Issued 11-2023 (was 1037A). Sheet Format Update.

Revised 10-2016: Updated Specifications Design: AASHTO LRFD 7th ED, Series of 2014 (was series of 1992). Changed Design Stresses (was AASHTO Standard Specifications For Highway Bridges, Series of 1992. Concrete in accordance with Section 9, f'c = 5,000 PSI. Prestressing steel in accordance with Section 9, f's = 270,000 PSI. Structural steel in accordance with Section 10, ASTM A36). Added Pile Data "Nominal Resistance" (was max. bearing value 50T). Changed prestressing force to 118 (was 116) kips for normal curing.
 Revised 10-2021: Updated spiral requirements to ASTM A1054 Grade 70 (was ASTM A82).
 This Sheet Redrawn 11-29-1990.
 MiscellaneousBridges.dgn - 1046 - This Sheet Re-Issued 11-2023. Sheet Format Update.



Pile Data		
Max. Length 1 pt. Pick-up	ft.	40
Max. Length 2 pt. Pick-up	ft.	55
f'c	psi	5000
Nominal Resistance Pn	kips	200



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 prestressing strands shall be normal to axis of pile.
 All prestressing strands are to be 1/2" diameter 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:

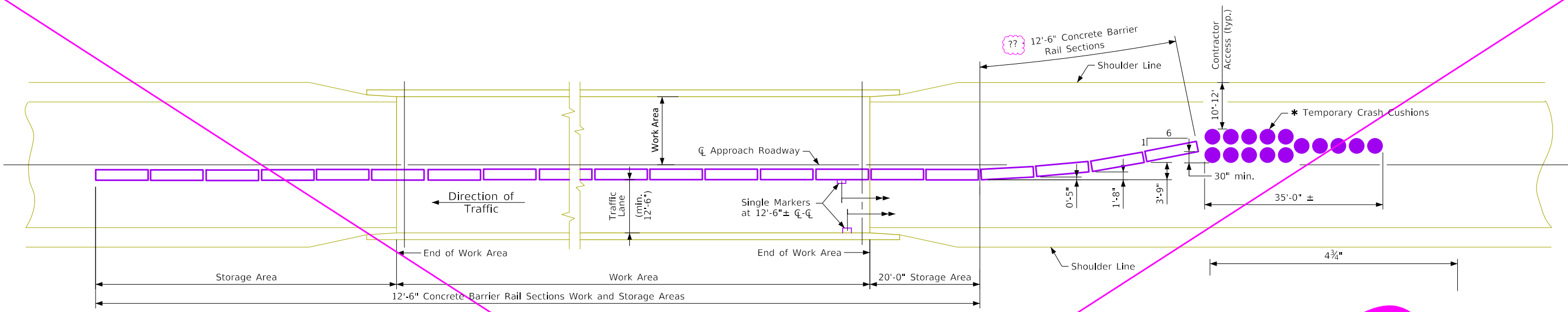
Design: AASHTO LRFD 7th Edition, Series of 2014.
 Construction: Iowa Department of Transportation Standard Specifications, current series, plus current Supplemental Specifications and Special Provisions.
Design Stresses:
 Design stresses for the following materials are in accordance with The AASHTO LRFD 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.

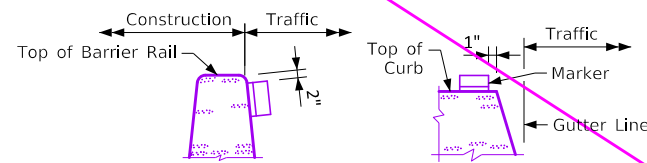
12" Prestressed Concrete Foundation Pile Material Components			
Item	Unit	L=40'	One Foot Increment
Concrete	c.y.	1.48	0.037
5 Gage Wire Spiral	lb.	32	0.62
Prestressing Steel	lb.	84	2.08

Approved By: *James Miller*
 Bridge Engineer

Latest Revision: 11-2023
 Date: _____
12" Prestr. Conc. Foundation Piles



Temporary Concrete Barrier Rail Layout
For One Way Traffic



Marker Details

NOTE: Color of marker shall be appropriate for edge line.

N = Number of 12'-6" TBR sections based on traffic lane and bridge width. Designer to determine number of sections.
REMOVE CLOUDED AREAS

Concrete Temporary Barrier Rail Notes:

Concrete temporary barrier rail shall be constructed as detailed and noted on the Standard Road Plans BA-401 for temporary barrier rail (precast concrete). Refer to other details, notes, and quantity items elsewhere in these plans for traffic control to be established in conjunction with the temporary barrier rail.

No stationary equipment or construction material is to be placed in front of the temporary barrier rail at any time.

Anchors are required only where the temporary barrier rail is adjacent to a drop-off. When anchors are required, see Standard Road Plans BA-401 for temporary barrier rail (precast concrete) for details. Holes for concrete anchors may be drilled after positioning the temporary barrier rail.

*** Note:**

See Standard Road Plan BA-500 for temporary crash cushions sand barrel.

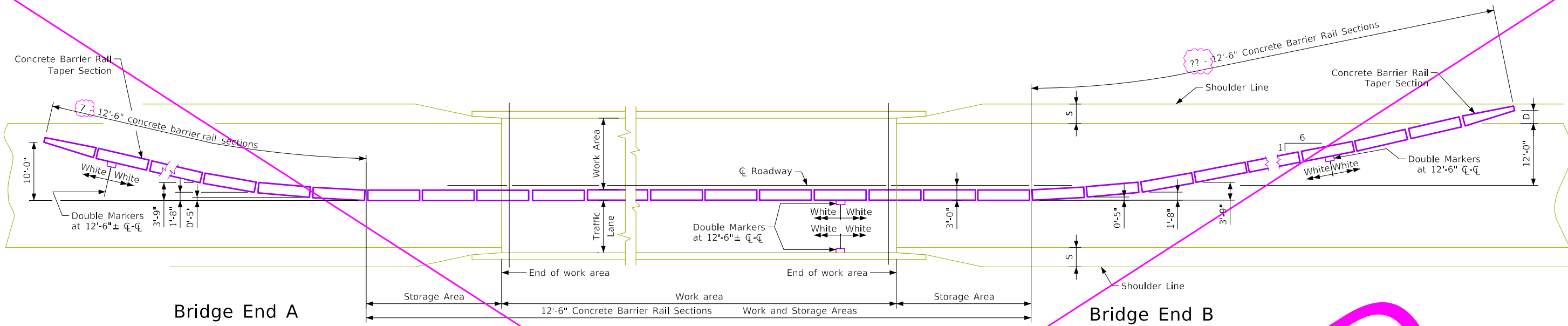
Cost of temporary crash cushions to be included with roadway bid items.

Item reference:
All temporary barrier rail shall be nominal 12'-6" long concrete units

F-Shape Temp. Barr. Rail - Conc.

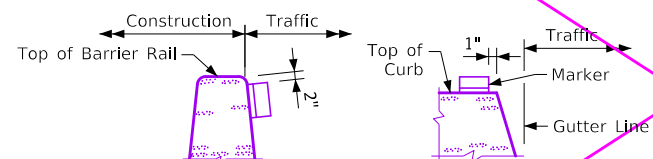
FILE NO.	ENGLISH	DESIGN TEAM	F-Shape Temporary Barrier Rail - Concrete	Standard Sheet 1049	COUNTY	PROJECT NUMBER	SHEET NUMBER
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Correction 02-14: Changed the TBR to the Temporary Structures Level.
Redrawn 09-97.
MiscellaneousBridges.dgn - 1049 - This Sheet Re-Issued 11-2023. Sheet Format Update.



Temporary Concrete Barrier Rail Layout for Two Way Traffic

Note: The layout shown is for one stage of construction and would be the same for the other stage by rotating 180°.



Marker Details

Note: Color of marker shall be appropriate for edge line.

Concrete Temporary Barrier Rail Notes:

Concrete temporary barrier rail shall be constructed as detailed and noted on the standard road plans ba-401 for temporary barrier rail (precast concrete). Refer to other details, notes, and quantity items elsewhere in these plans for traffic control to be established in conjunction with the temporary barrier rail. No stationary equipment or construction material is to be placed in front of the temporary barrier rail at any time. Anchors are required only where the temporary barrier rail is adjacent to a drop-off. When anchors are required, see standard road plans ba-401 for temporary barrier rail (precast concrete) for details. Holes for concrete anchors may be drilled after positioning the temporary barrier rail.

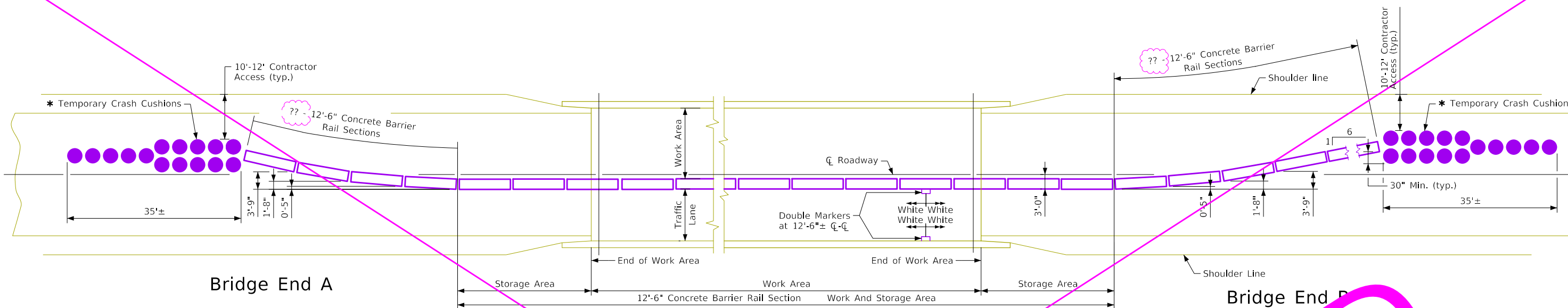
Concrete Tapered Sections Can Only be Used in Urban Conditions with Less than 35 Mph Posted Speed Limit

Item reference:
All temporary barrier rail shall be nominal 12'-6" long concrete units.

F-Shape Temp. Barr. Rail - Conc.

Correction 02-14: Changed the TBR to the Temporary Structures Level. Redrawn 09-97. MiscellaneousBridges.dgn - 1050 - This Sheet Re-Issued 11-2023. Sheet Format Update.

FILE NO.	ENGLISH	DESIGN TEAM	F-Shape Temporary Barrier Rail - Concrete	Standard Sheet 1050	COUNTY	PROJECT NUMBER	SHEET NUMBER
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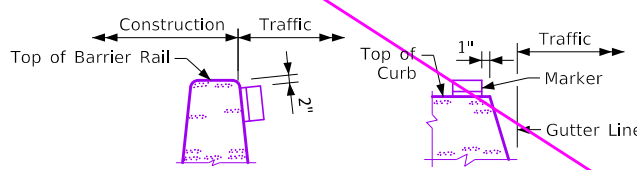


Bridge End A

Bridge End B

Temporary Concrete Barrier Rail Layout for Two Way Traffic

***Note:**
See standard road plan BA-500 for temporary crash cushions sand barrel.
Cost of temporary crash cushions to be included with roadway bid items.



Marker Details

Note: Color of marker shall be appropriate for edge line.

VOID

VOID

Concrete Temporary Barrier Rail Notes:

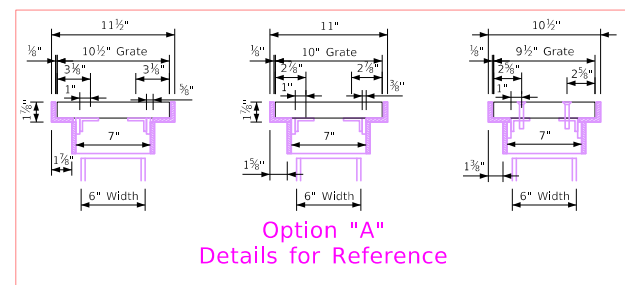
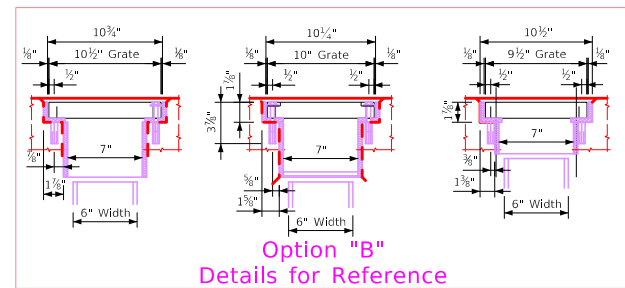
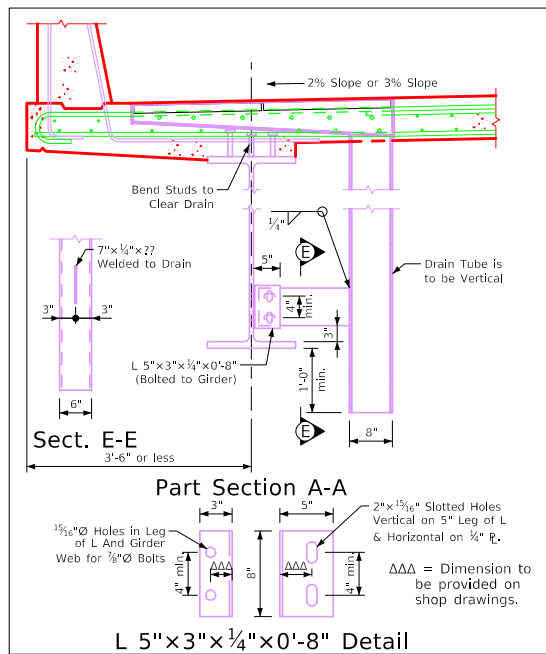
- Concrete temporary barrier rail shall be constructed as detailed and noted on the standard road plans BA-401 for temporary barrier rail (precast concrete).
- Refer to other details, notes, and quantity items elsewhere in these plans for traffic control to be established in conjunction with the temporary barrier rail.
- No stationary equipment or construction material is to be placed in front of the temporary barrier rail at any time.
- Anchors are required only where the temporary barrier rail is adjacent to a drop-off when anchors are required, see standard road plans BA-401 for temporary barrier rail (precast concrete) for details. Holes for concrete anchors may be drilled after positioning the temporary barrier rail.

Item reference:
All temporary barrier rail shall be nominal 12'-6 long concrete units.

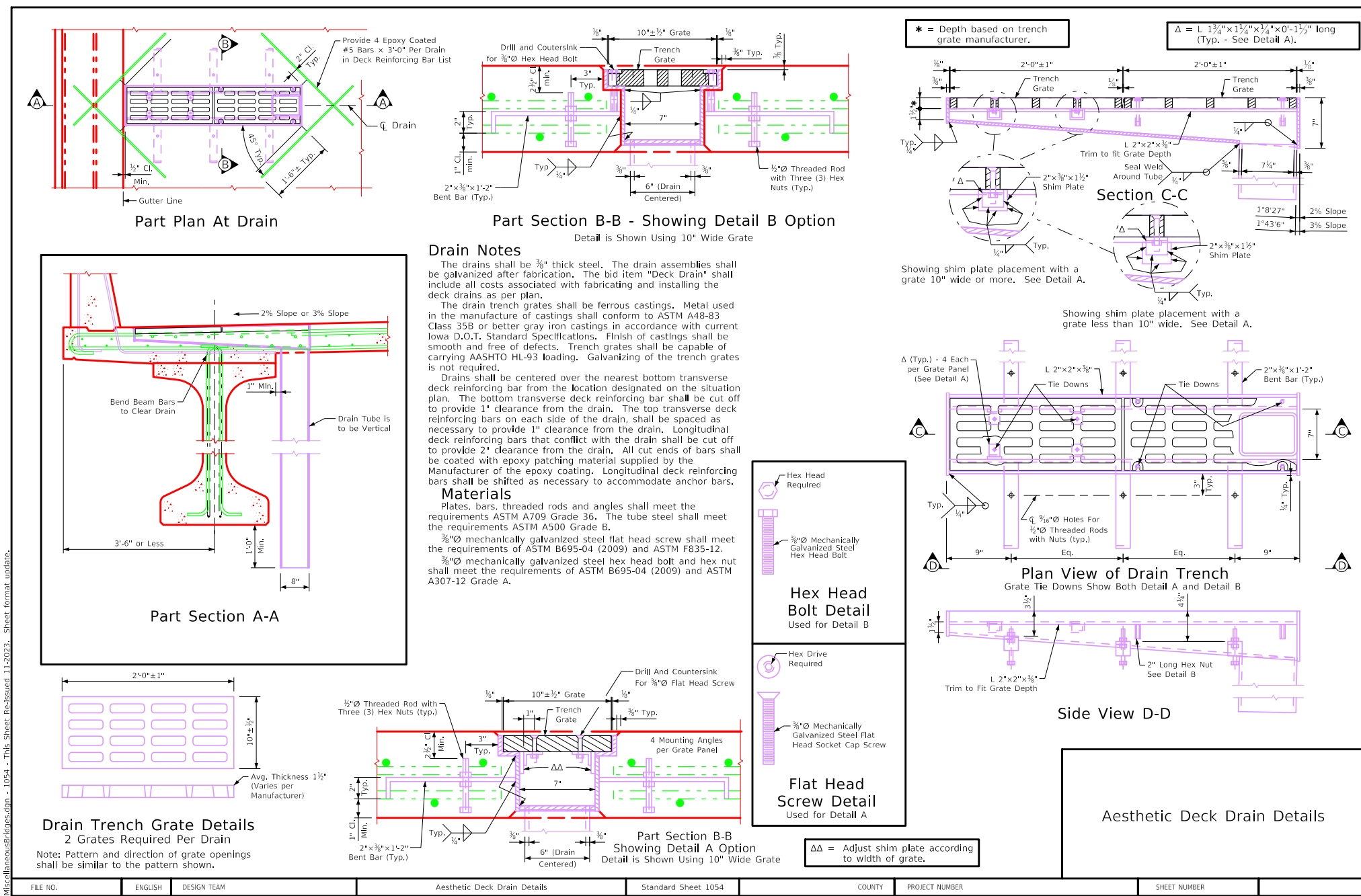
F-Shape Temp. Barr. Rail - Conc.

Correction 02-14: Changed the TBR to the Temporary Structures Level. Redrawn 09-97. MiscellaneousBridges.dgn - 1050A - This Sheet Re-Issued 11-2023. Sheet Format Update.

FILE NO.	ENGLISH	DESIGN TEAM	F-Shape Temporary Barrier Rail - Concrete	Standard Sheet 1050A	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:31 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\MiscellaneousBridges.dgn				



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 3/16".
 Revised 07-11: Changed the Trench Gate AASHTO Loading From 1520 to 1150. Changed Drain Tube to Round Tube with Square Tube Option. Gate Hold Down Bolts Changed to 3/8" size.
 Revised 07-13: Changed the Trench Gate AASHTO Loading From 1150 to 1150. Changed Drain Tube to Round Tube with Square Tube Option. Gate Hold Down Bolts Changed to 3/8" size.
 Revised 07-13: The Spacing Stud 3/8" x 3/8" x 3/8" Hex Head Bolt. Changed to 1/2" x 3/8" x 3/8" Hex Head Bolt. Mechanically Galvanized.
 Revised 10-16: Added 1/2" Flat 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"x2"x3/8" Drain Tube (W88, 88' Dia. x 3/8"). Structural Drain Tube may be Substituted with a 6"x8"x3/8" Structural Tube.
 Revised 04-18: Moved Dimension Text in 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" to Down Spout Bracket on Steel Girder Detail. Changed all References of "Slab" to "Deck".
 Added "ΔΔΔ = Dimension to be Provided on Shop Drawings".



FILE NO.	ENGLISH	DESIGN TEAM	Aesthetic Deck Drain Details	Standard Sheet 1054	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:32 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot\Int\Isn\PWMain\Documents\Highway\Bridges\Standards\Bridges\Miscellaneous\Bridges.dgn				

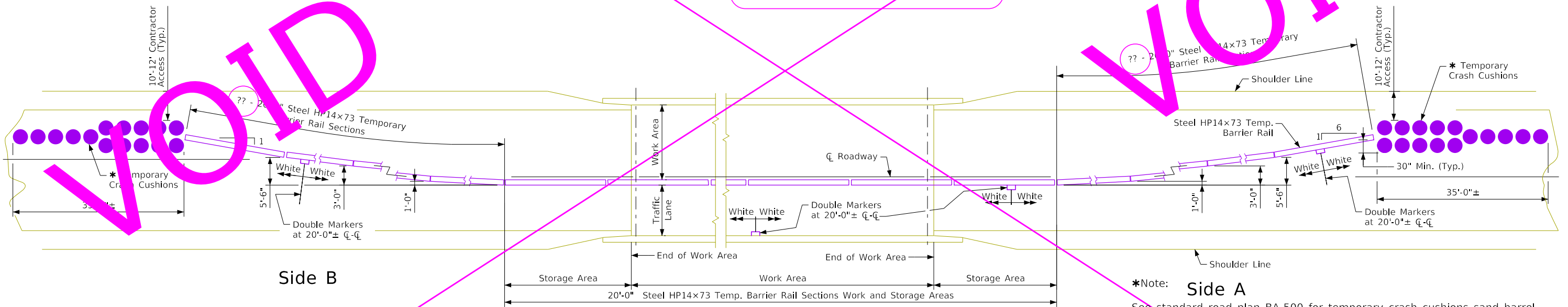
Steel Temporary Barrier Rail Notes :

The steel HP14x73 temporary barrier rails shall be constructed as detailed and noted on the standard road plans BA-400 for Temporary Barrier Rail (Steel).
 HP14x73 sections are to be joined before p.c. concrete fill is placed. HP sections may be joined by butt welds on both exterior faces as detailed or by other means approved by the Engineer. HP sections shall be free from excessive sweep and camber; straightening may be required by the Engineer in order to produce a stable barrier.
 Concrete mix for the p.c. fill may be any Iowa D.O.T. construction specification mix or may be a commercial ready-mix with a minimum $f'c = 2500$ p.s.i. The p.c. fill may be deposited by a method acceptable to the Engineer. Limits of fill shown are approximate and may be rough or slumped depending on the method of bulkheading.
 Refer to other details, notes and quantity items, elsewhere in these plans for traffic control to be established in conjunction with the temporary barrier rail.
 No stationary equipment or construction material is to be placed in front of the temporary barrier rail at any time.
 Traffic markers shall be a retro-reflective type, in accordance with Materials I.M. 486.06. They shall be located as shown on this sheet. The Contractor shall maintain the markers and shall promptly replace any missing or damaged units. All costs for furnishing, installing and maintaining markers shall be included in the price bid for "Temporary Barrier Rail, Steel".

Care shall be taken in moving the steel temporary barrier rail for stage 2 construction, so that the new concrete of stage 1 will not be damaged. Any damage shall be repaired at the Contractor's expense.
 The steel HP14x73 temporary barrier rail is to be bid on a lineal foot basis. The number of lineal feet of temporary barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for "Temporary Barrier Rail, Steel" shall be full compensation for furnishing all material, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications.
 Anchors are required only where the temporary barrier rail is adjacent to a drop-off. When anchors are required, see standard road plans BA-400 for Temporary Barrier Rail (Steel) for details. Holes for concrete anchors may be drilled after positioning the temporary barrier rail.

Note to Designer:
 N = Number of 20'-0" TBR sections based on traffic lane and bridge width. Designer to determine number of sections.

VOID

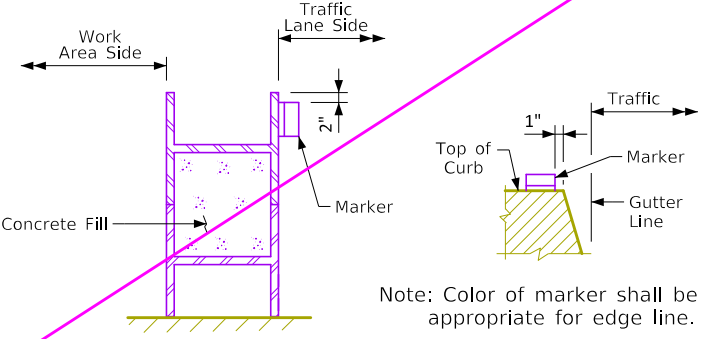


Temporary Barrier Rail Layout for Two Way Traffic

Note:
 The layout shown is for one stage of construction and would be a mirror image for the other stage.

*Note: **Side A**
 See standard road plan BA-500 for temporary crash cushions sand barrel.

Cost of temporary crash cushions to be included with roadway bid items.



Marker Details

Note: Color of marker shall be appropriate for edge line.

Note:
 All connection material is to be included in the price bid for "Temporary Barrier Rail, Steel".

Steel HP14x73 Temp. Barr. Rail

Correction 02-14: Changed the TBR Sections to the Temporary Structures level.
 Redrawn 09-03.
 MiscellaneousBridges.dgn - 1056 - This Sheet Re-Issued 11-2023. Sheet Format Update.

FILE NO.	ENGLISH	DESIGN TEAM	Steel HP14x73 Temporary Barrier Rail	Standard Sheet 1056	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:33 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot.int.lan:PWM\Documents\Highway\Bridges\Standards\Bridges\MiscellaneousBridges.dgn				

Steel Temporary Barrier Rail Notes :

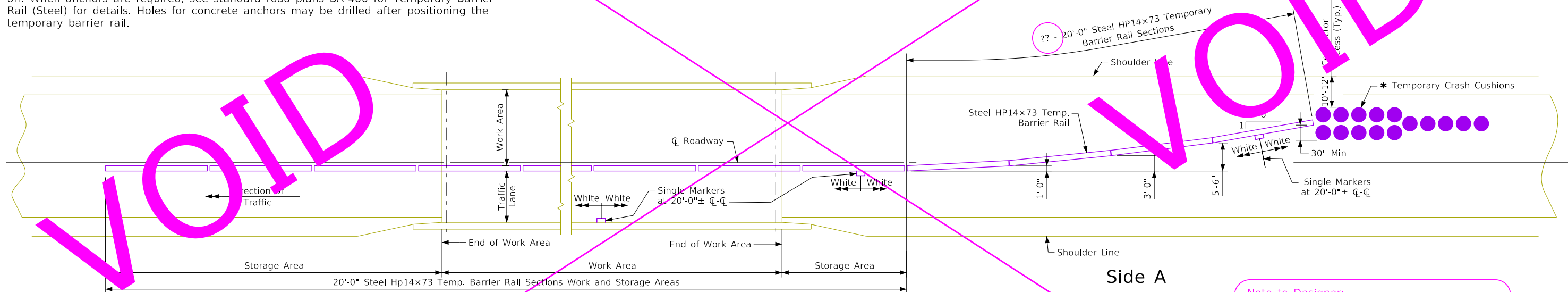
The steel HP14x73 temporary barrier rails shall be constructed as detailed and noted on the standard road plans BA-400 for Temporary Barrier Rail (Steel).
 HP14x73 sections are to be joined before p.c. concrete fill is placed. HP sections may be joined by butt welds on both exterior faces as detailed or by other means approved by the Engineer. HP sections shall be free from excessive sweep and camber; straightening may be required by the Engineer in order to produce a stable barrier.
 Concrete mix for the p.c. fill may be any Iowa D.O.T. construction specification mix or may be a commercial ready-mix with a minimum $f'c = 2500$ p.s.i. The p.c. fill may be deposited by a method acceptable to the Engineer. Limits of fill shown are approximate and may be rough or slumped depending on the method of bulkheading.
 Refer to other details, notes and quantity items, elsewhere in these plans for traffic control to be established in conjunction with the temporary barrier rail.
 No stationary equipment or construction material is to be placed in front of the temporary barrier rail at any time.

Traffic markers shall be a retro-reflective type, in accordance with Materials I.M. 486.06. They shall be located as shown on this sheet. The Contractor shall maintain the markers and shall promptly replace any missing or damaged units. All costs for furnishing, installing and maintaining markers shall be included in the price bid for "Temporary Barrier Rail, Steel".

Care shall be taken in moving the steel temporary barrier rail for stage 2 construction, so that the new concrete of stage 1 will not be damaged. Any damage shall be repaired at the Contractor's expense.

The steel HP14x73 temporary barrier rail is to be bid on a lineal foot basis. The number of lineal feet of temporary barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for "Temporary Barrier Rail, Steel" shall be full compensation for furnishing all material, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications.

Anchors are required only where the temporary barrier rail is adjacent to a drop-off. When anchors are required, see standard road plans BA-400 for Temporary Barrier Rail (Steel) for details. Holes for concrete anchors may be drilled after positioning the temporary barrier rail.



Temporary Barrier Rail Layout for One Way Traffic

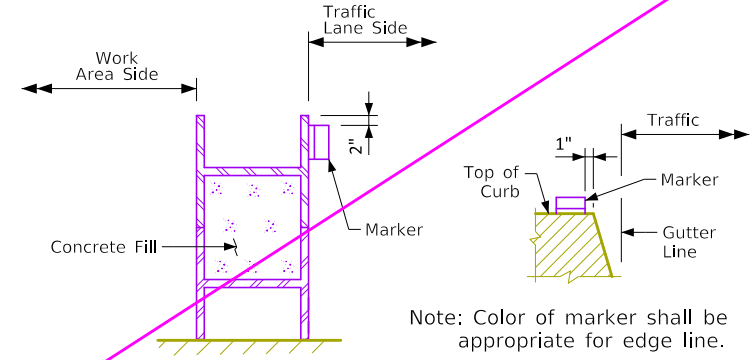
Note:
 The layout shown is for one stage of construction and would be a mirror image for the other stage.

Note to Designer:
 N = Number of 20'-0" TBR sections based on traffic lane and bridge width. Designer to determine number of sections.

*Note:
 See standard road plan BA-500 for temporary crash cushions sand barrel.
 Cost of temporary crash cushions to be included with roadway bid items.

Note :
 All connection material is to be included in the price bid for "Temporary Barrier Rail, Steel".

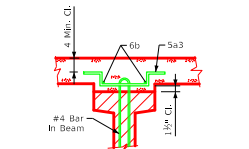
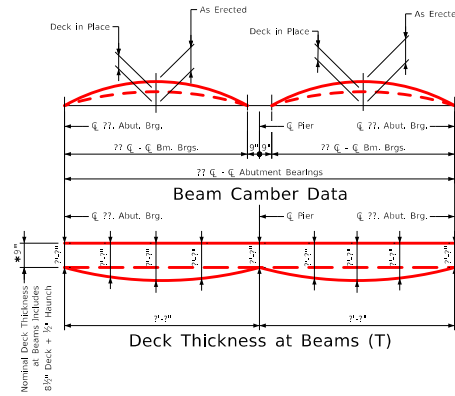
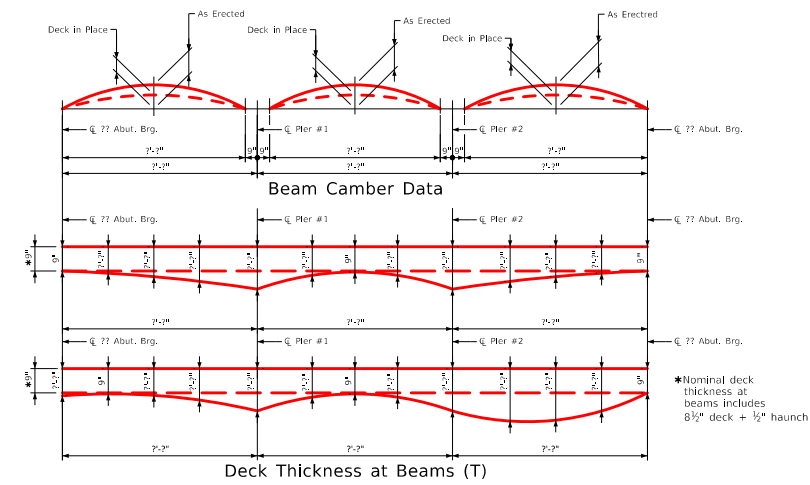
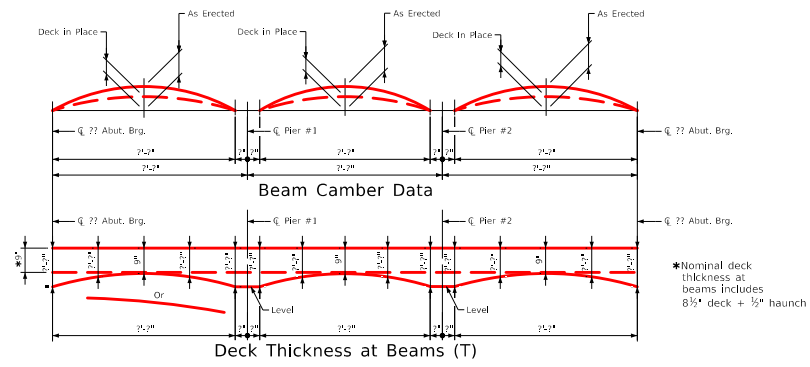
Steel HP14x73 Temp. Barr. Rail



Marker Details

Correction 02-14: Changed the TBR Sections to the Temporary Structure level. Redrawn 09-03. MiscellaneousBridges.dgn - 1058 - This Sheet Re-Issued 11-2023. Sheet Format Update.

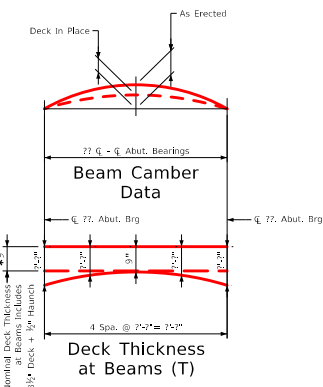
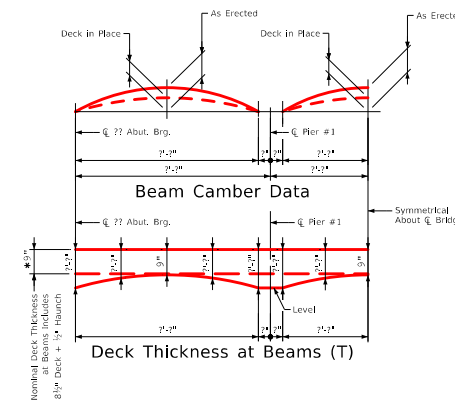
FILE NO.	ENGLISH	DESIGN TEAM	Steel H14x73 Temporary Barrier Rail	Standard Sheet 1058	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:33 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot.int.lan:PWM\Documents\Highway\Bridges\Standards\Bridges\MiscellaneousBridges.dgn				



Section Thru Deck Haunch
Typical Each Line of Beams

Haunch Reinforcing Layout
(Required at All Piers)

Note: Place one 5a3 bar adjacent to each #4 beam stirrup (4b) bars that extend from the beams into the deck haunch.



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

Beam Camber Data

Deck Thickness at Beams (T)

Deck Thickness Details

Deck Thickness Details

Deck Thickness Details

Note to Designer: See Examples Outside of Sheet Border.

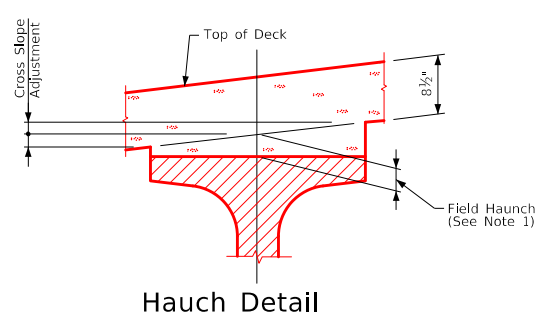
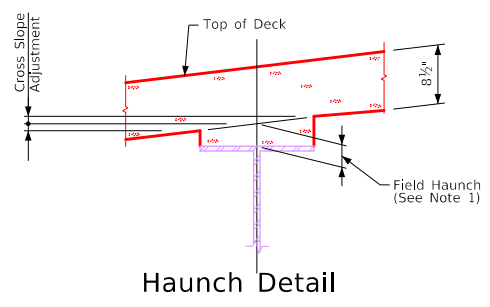
Revised 06/2017: Removed Center to Bar from Under #4 Bar in Section Thru Deck Haunch Detail. Was Three (3) Bars, Now Two!

Revised 01/2019: Changed all references of "5a3" to "5a2".

Revised 02/2023: Updated all references of "5a3" to "5a2". This sheet replaced 11-2023. Sheet Format Update.

FILE NO.	ENGLISH	DESIGN TEAM	Beam Camber and Deck Thickness Details	Standard Sheet 1065	COUNTY	PROJECT NUMBER	SHEET NUMBER
65334	AM	11/9/2023	bk	pw	NT	Pw	11

Revised 06-12: The Allowable Field Haunch Max. & Min. Were Changed to Inches and Decimals of Feet. Note & Note 1 Were Changed. The Slab Haunch Locations Example was Replaced With a Note.

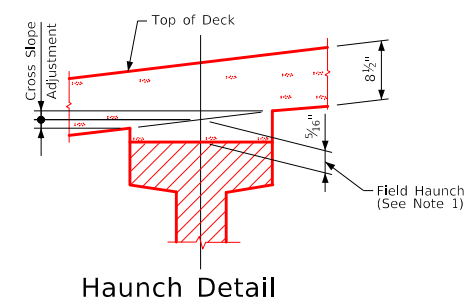


Inch →
Inch →
Inch (feet) →

Beam Line	☐ ? Abut. Bearing				☐ Pier No. 1 Bearings										☐ Pier No. 2 Bearings			☐ ? Abut. Bearing				
	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	
A																						
B																						
C																						
D																						
E																						
F																						
G																						
H																						

	Beam Line	☐ ? Abut. Bearing				☐ Pier No. 1 Bearings										☐ Pier No. 2 Bearings			☐ ? Abut. Bearing			
		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
Anticipated Deflection Due to Deck (in.)	All	0				0	0										0	0				0
Cross Slope Adjustments (in.)	A, B, C, D, E & F																					
	C																					
Allowable Field Haunch (in. & ft.)	Max.	All	Example 2 1/2 (0.208)																			
	Min.	All	Example 2 1/2 (0.208)																			

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



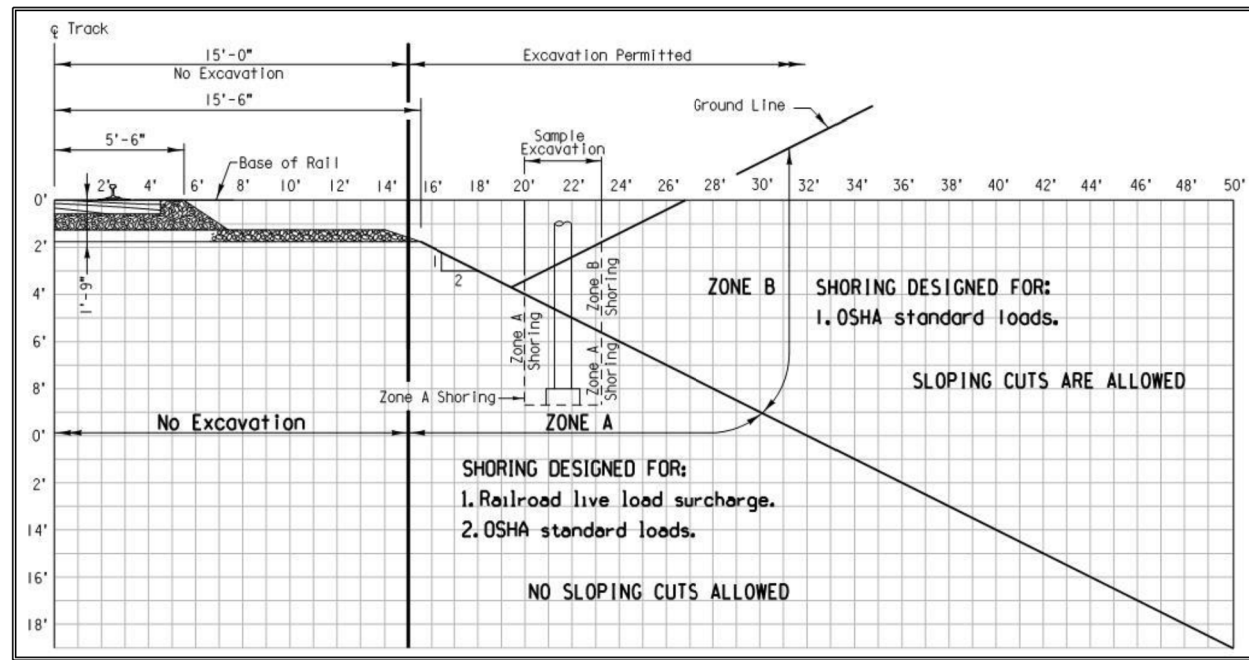
Note: Bridge seat elevations are set based on theoretical camber and beam deflections. These bridge seats will provide a theoretical beam haunch within design parameters. Field haunches are determined using surveyed top of beam elevations and "Beam Line Haunch Elevation" data. Allowable maximum and minimum "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.

Deck Haunch Data Details

FILE NO.	ENGLISH	DESIGN TEAM	Deck Haunch Data Details	Standard Sheet 1066	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:35 AM	11/9/2023	bkloss	pw:\NTP\int1.dot.int\lan:PWM\Main\Documents\Highway\Bridges\Standards\Bridges\MiscellaneousBridges.dgn				

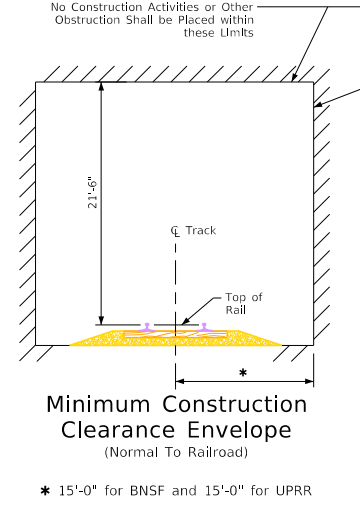
Revised 09-13: Railroad Changed the Minimum Vertical Construction Clearance to 21'-6". Distance From Mainline Track to Edge of Embankment Changed to 15'-6".
 Revised 06-17: Added Note Outside of Sheet Border to Explain the Use of this Strand Sheet with Archived Methods (Memo MM201).
 Revised 07-2019: For UPRR, Changed Horizontal Distance of Minimum Construction Clearance 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.
 Issued 12-2006.
 MiscellaneousBridges.dwg - 1067 - This Sheet Redefined 12-02-03 - 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



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

FILE NO.	ENGLISH	DESIGN TEAM	BNSF & UPRR General Notes & Shoring	Standard Sheet 1067	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:35 AM	11/9/2023	bkloss	pw:\WTP\wint1.dot;int;lan:PVM\Main\Documents\Highway\Bridges\Standards\Bridges\Miscellaneous\Bridges.dgn				

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.

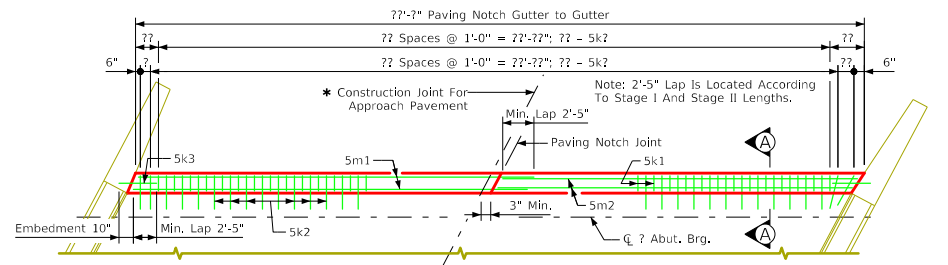
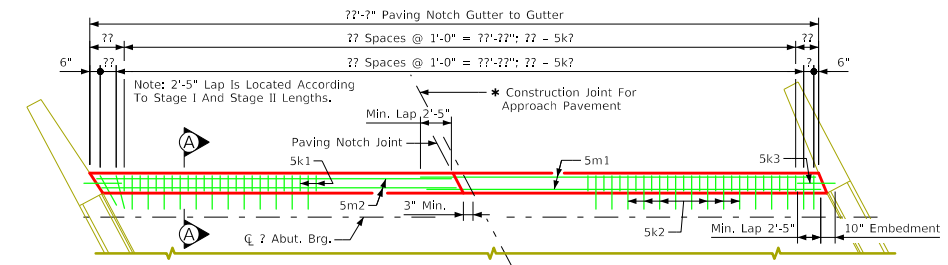


Plan View

- 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.



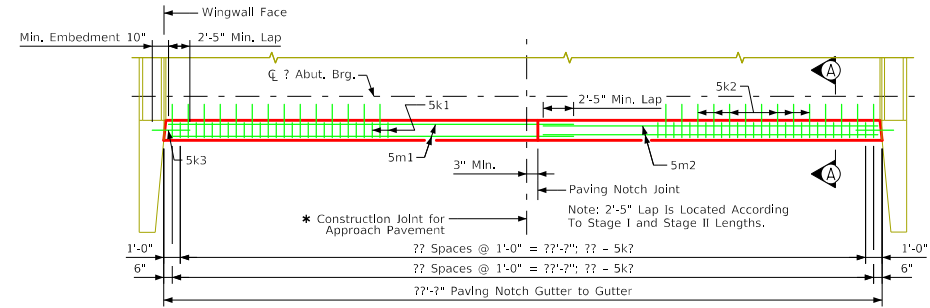
Note: 5k3 bars shall be set as dowels embedding 10 inches minimum into the existing bridge wingwalls and extending a minimum of 2'-5" into the new paving notch replacement.

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.

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.

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.

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.

Note: Use "BR-203" approach pavement standard for moveable abutment.

Location

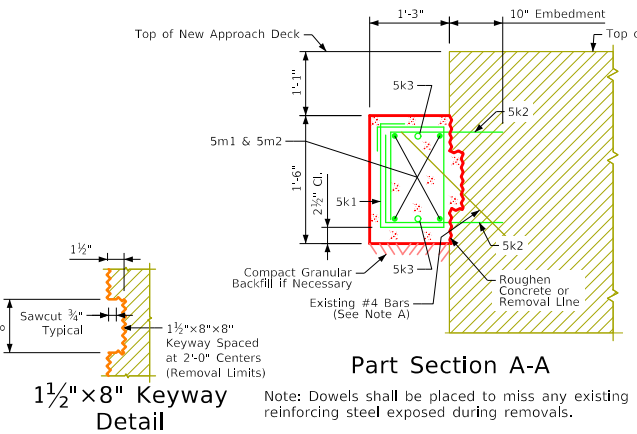
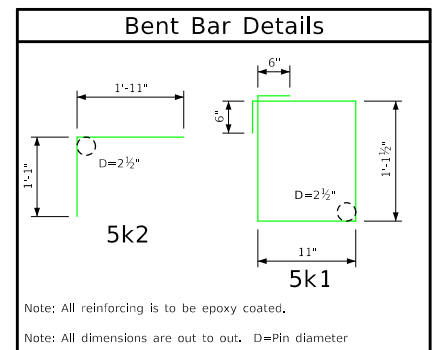
?
T-ZN R-2W
Section ?
? Township
? County
? FHWA No. ?
? Bridge Maint. No. ?
Latitude ??,123456°
Longitude ??,123456°

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.



Note A: The bottom portion of the existing #4 bars shall be carefully exposed and incorporated into new work. The bar shall be cut off to provide 2 inches of cover from the top of the new paving notch. The top portion of the bar shall be cut off flush or slightly below the concrete surface and the ends painted with 2 coats of zinc rich paint.

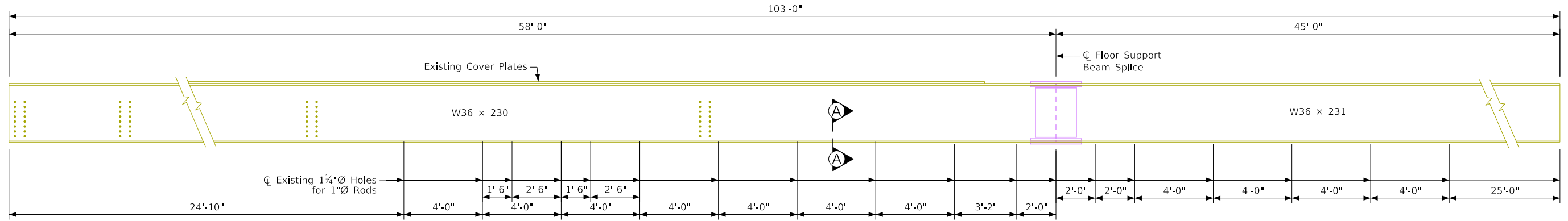
Design History at this Site
(Includes this Design)

Des. No.	Type of Work
???	?
???	?
???	?
???	?
???	?

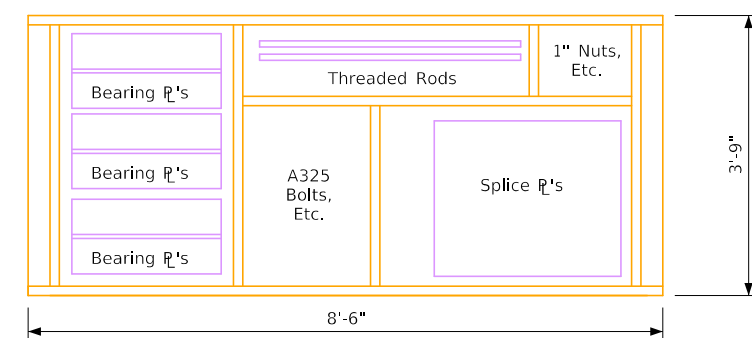
Paving Notch Replacement

FILE NO.	ENGLISH	DESIGN TEAM	Paving Notch Replacement	Standard Sheet 1068	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:36 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot\intJan:PWM\Main\Documents\Highway\Bridges\Standards\Bridges\Miscellaneous\Bridges.dgn				

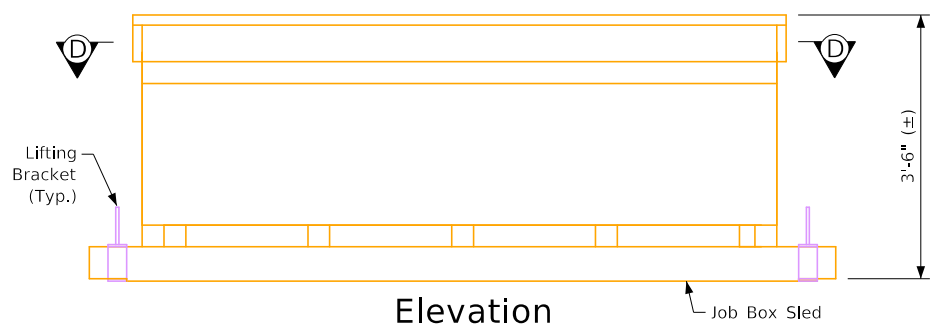
Correction 10-10 - Article 2301.12 Changed to 2301.03. E. ...
 Revised 12-13 Construction Specifications Date was Changed to 2012. Concrete Strength was Changed to 4.0 Ksi. FHWA No. Entry was Added to the Location Information.
 Revised 09-2016 - Changed the Bridge Approach Pavement Standard to "BR-203". Standard Specifications Construction Series Date was Changed to 2015 (was 2012).
 Revised 06-2017 - Added Statement in Paving Notch Replacement Note Paragraph "Granular Backfill and Compaction As Needed". Updated Design History Table.
 Revised 07-2019; Changed Bent Ends (Hook Leg) of 5k1 Bar to 6" (Was 4 1/2"). Changed All References of "Slab" to "Deck".
 English\Miscellaneous\Bridges.dgn - 1068 - This Sheet Issued 04-09.
 Miscellaneous\Bridges.dgn - 1068 - This Sheet Re-issued 11-2023. Sheet Format Update.



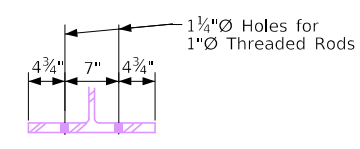
Elevation View of Floor Support Beam



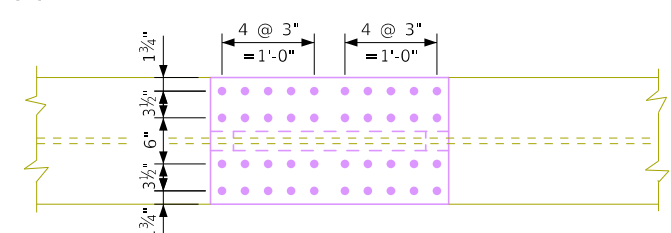
View D-D
Showing Interior Partitions
(Lid Not Shown)



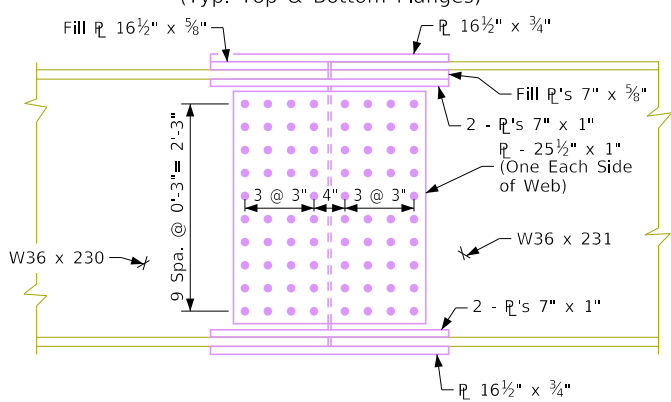
Job Box Details



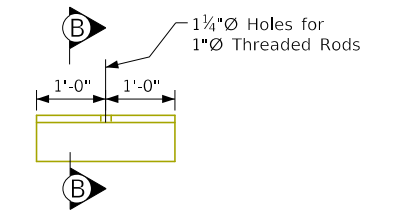
Part Section A-A



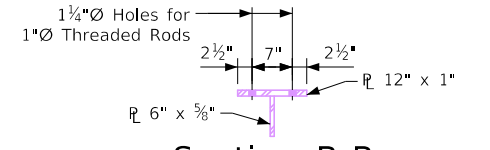
Flange Splice Details
(Typ. Top & Bottom Flanges)



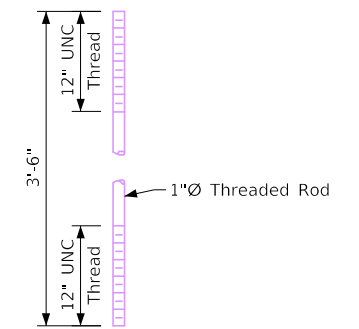
Floor Support Beam Splice Details



Bearing Pl.
(19 Pieces)



Section B-B



Threaded Rod Details
(38 Pieces)

Floor Support Beam System Notes:

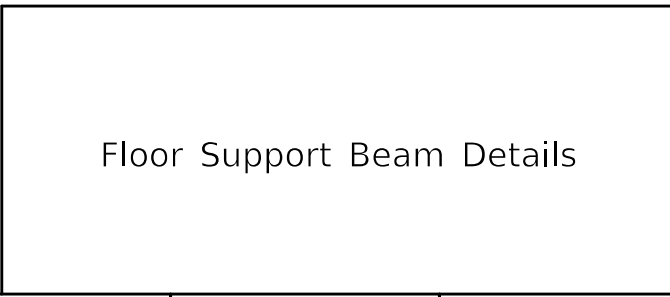
The floor support beam system is the property of the Iowa D.O.T., and is stored at the Iowa D.O.T. maintenance yard in Ames at intersection of I-35/US30. The floor support beam sections and job box containing items listed in inventory on this sheet are located at facility in NE corner of yard. Floor 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	

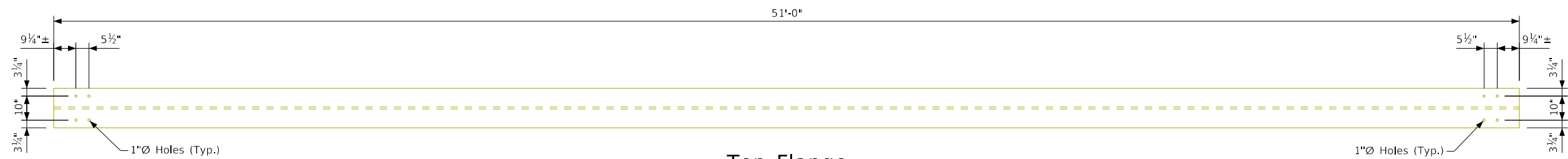
Job Box Inventory		
Number	Item	Location
2	Web Splice Pl 25 1/2" x 1" x 30 1/2"	
4	Flange Splice Pl 7" x 1" x 31 1/2"	
2	Flange Splice Pl 16 1/2" x 3/4" x 31 1/2"	
1	Fill Pl 15 3/4" x 3/8" x 16 1/2"	Top Flange
2	Fill Pl 7" x 5/8" x 16 1/2"	Top Flange
19	Bearing Pl - 2'-0" Lengths	
38	1"Ø x 3'-6" Threaded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



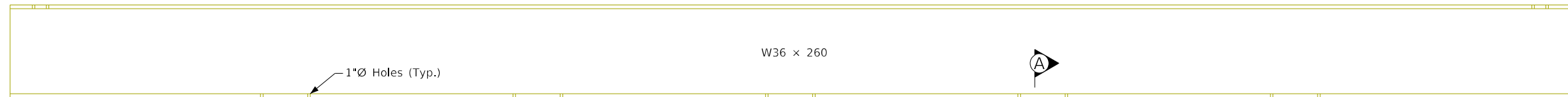
Floor Support Beam Details

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.

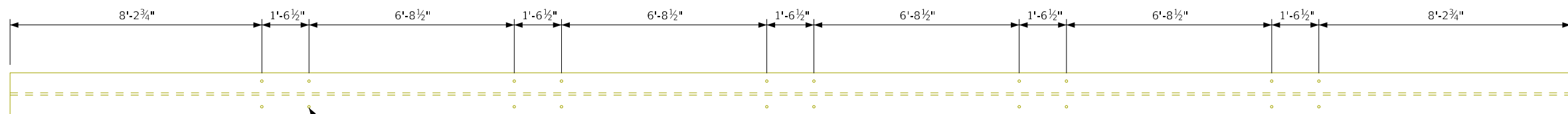
Revised 11-09: High Strength Bolt Replacement Note was Deleted.
Issued 05-08
MiscellaneousBridges.dgn - 1090 - This Sheet Re-Issued 11-2023. Sheet Format Update.



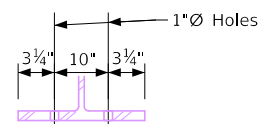
Top Flange



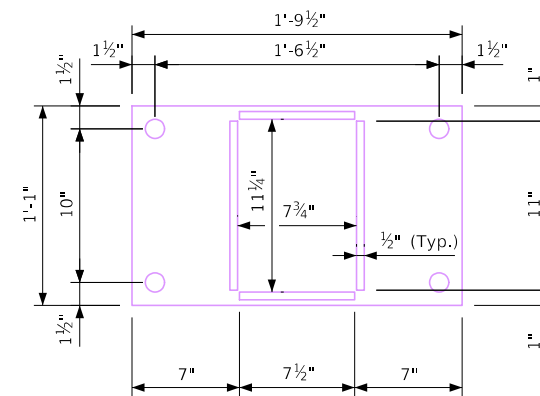
Elevation



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.

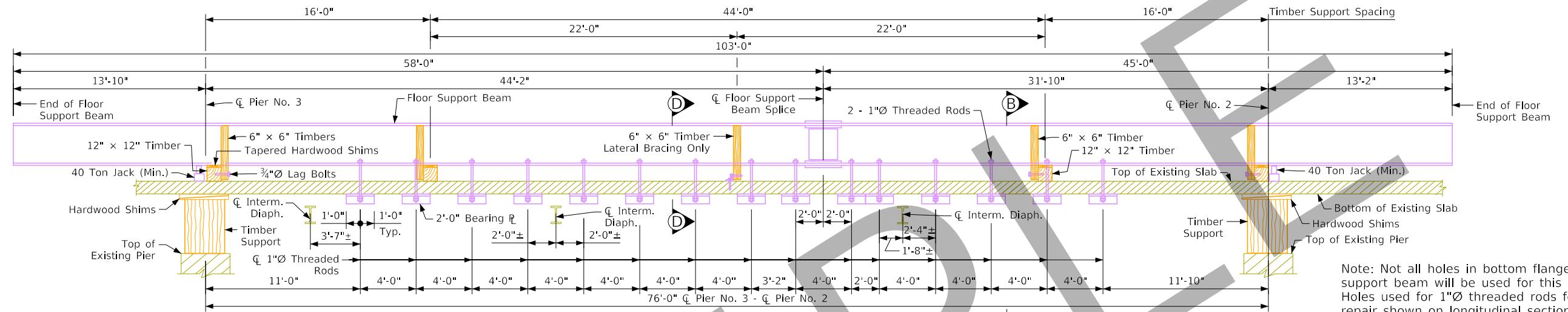
The lump sum bid item "Structural Steel, Haul + Storing" shall include all costs associated with the handling and transport of the support beams from the Iowa D.O.T. maintenance yard in Ames to the job site, and returning these materials.

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

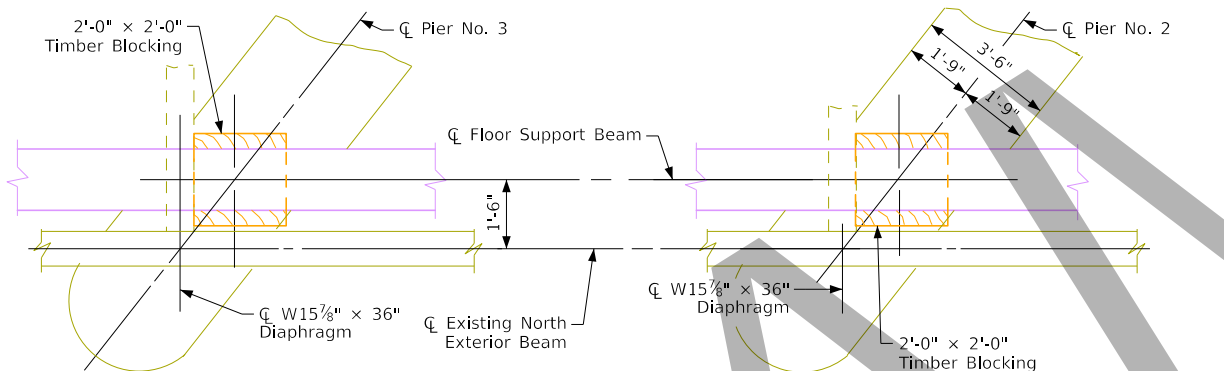
Issued 09-14 MiscellaneousBridges.dgn - 1090A - This Sheet Re-Issued 11-2023. Sheet Format Update.

FILE NO.	ENGLISH	DESIGN TEAM	Floor Support Beam Details	Standard Sheet 1090A	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:37 AM	11/9/2023	bkloss	pw:\NTP\wint1.dot.int.lan:PWM\Main\Documents\Highway\Bridges\Standards\Bridges\MiscellaneousBridges.dgn				

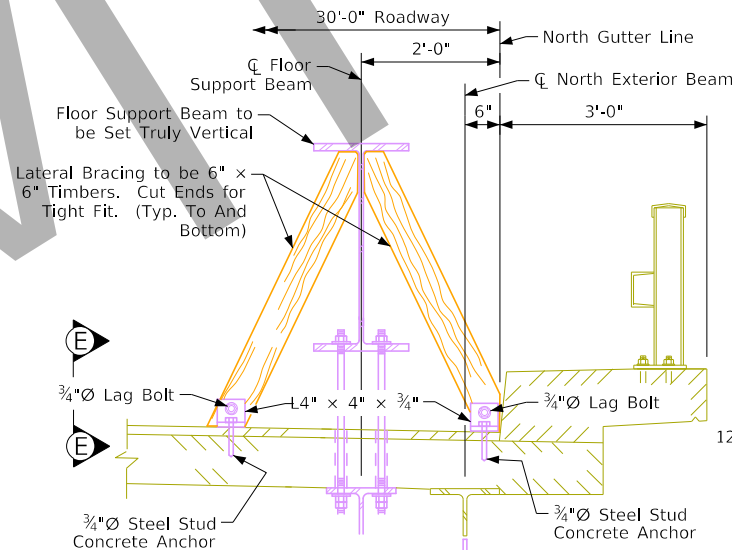


Longitudinal Section A-A
(Showing Floor Support Beam Details - Looking South)

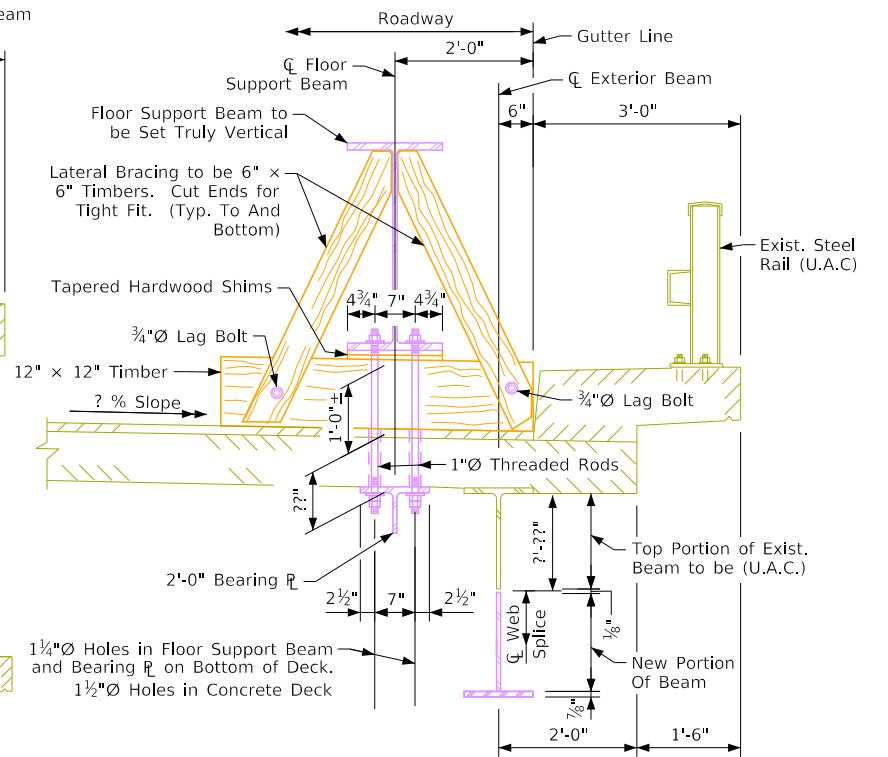
Note: Not all holes in bottom flange of floor support beam will be used for this repair. Holes used for 1"Ø threaded rods for this repair shown on longitudinal section A-A.



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

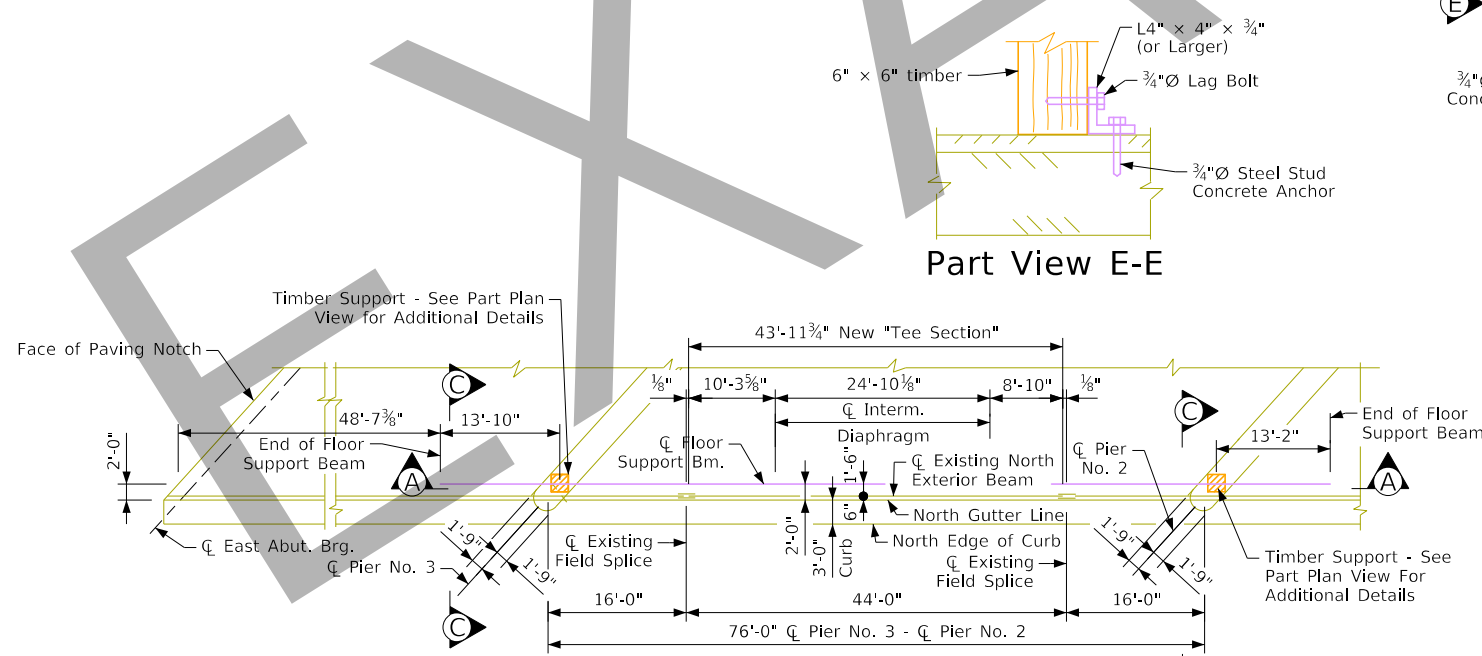


Part Section D-D

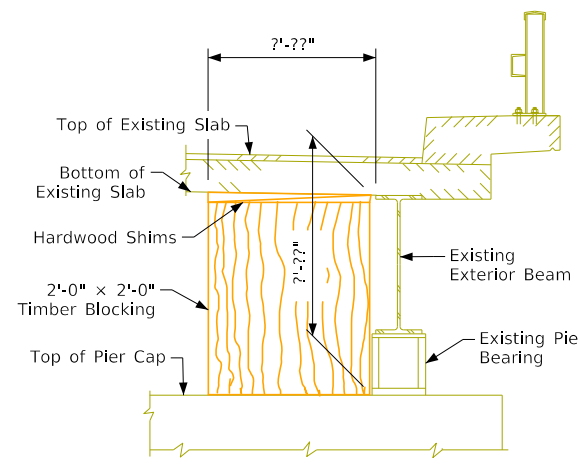


Part Section B-B

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



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



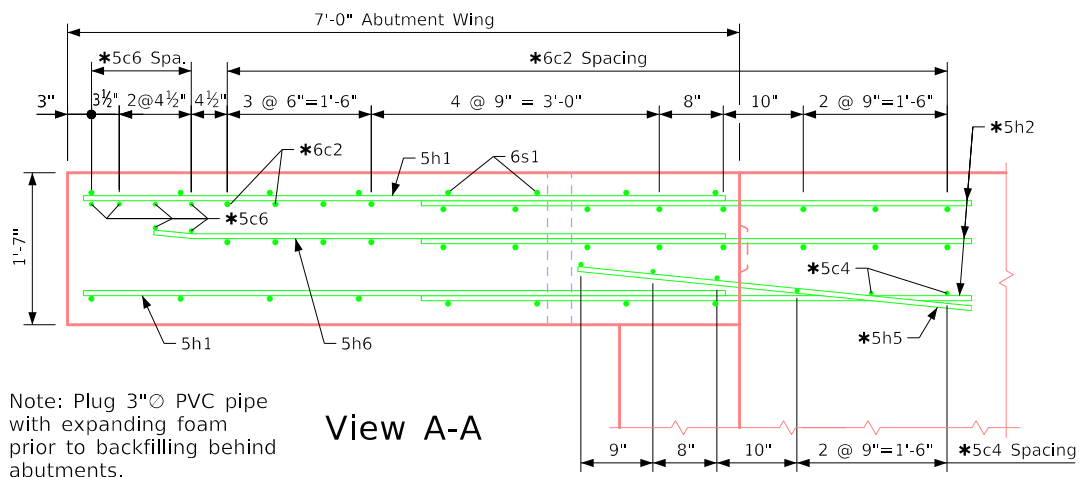
Part Section C-C

(Showing Timber Support for End of Floor Support Beam. Floor Support Beam Not Shown.)

Floor Support Beam - Layout

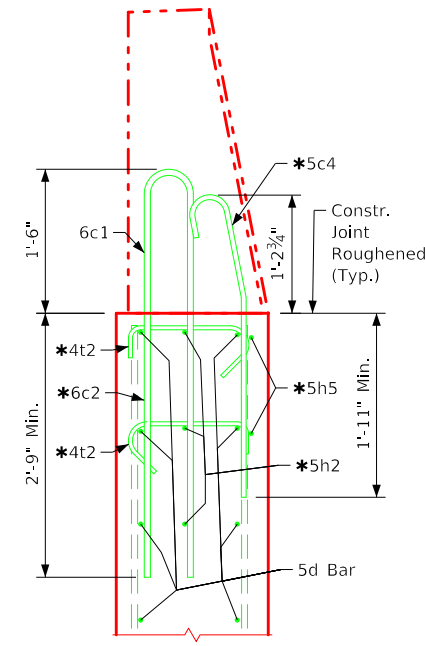
Issued 05-08 MiscellaneousBridges.dgn - 1091 - This Sheet Re-Issued 11-2023. Sheet Format Update.

FILE NO.	ENGLISH	DESIGN TEAM	Floor Support Beam Layout	Standard Sheet 1091	COUNTY	PROJECT NUMBER	SHEET NUMBER
8:51:38 AM	11/9/2023	bkloss	pw:\NTP\int1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\MiscellaneousBridges.dgn				



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

View A-A



Section B-B

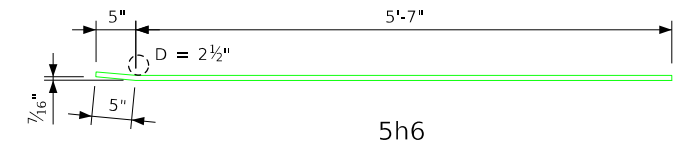
*Barrier rail end section bars to be placed with abutment wing and abutment.

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.

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		14	6'-8"	97
5h6	Horizontal Wingwall		3	6'-0"	19
6s1	Vertical Both Faces		16	5'-10"	140
Epoxy Reinforcing Total Weight (lbs.)					256



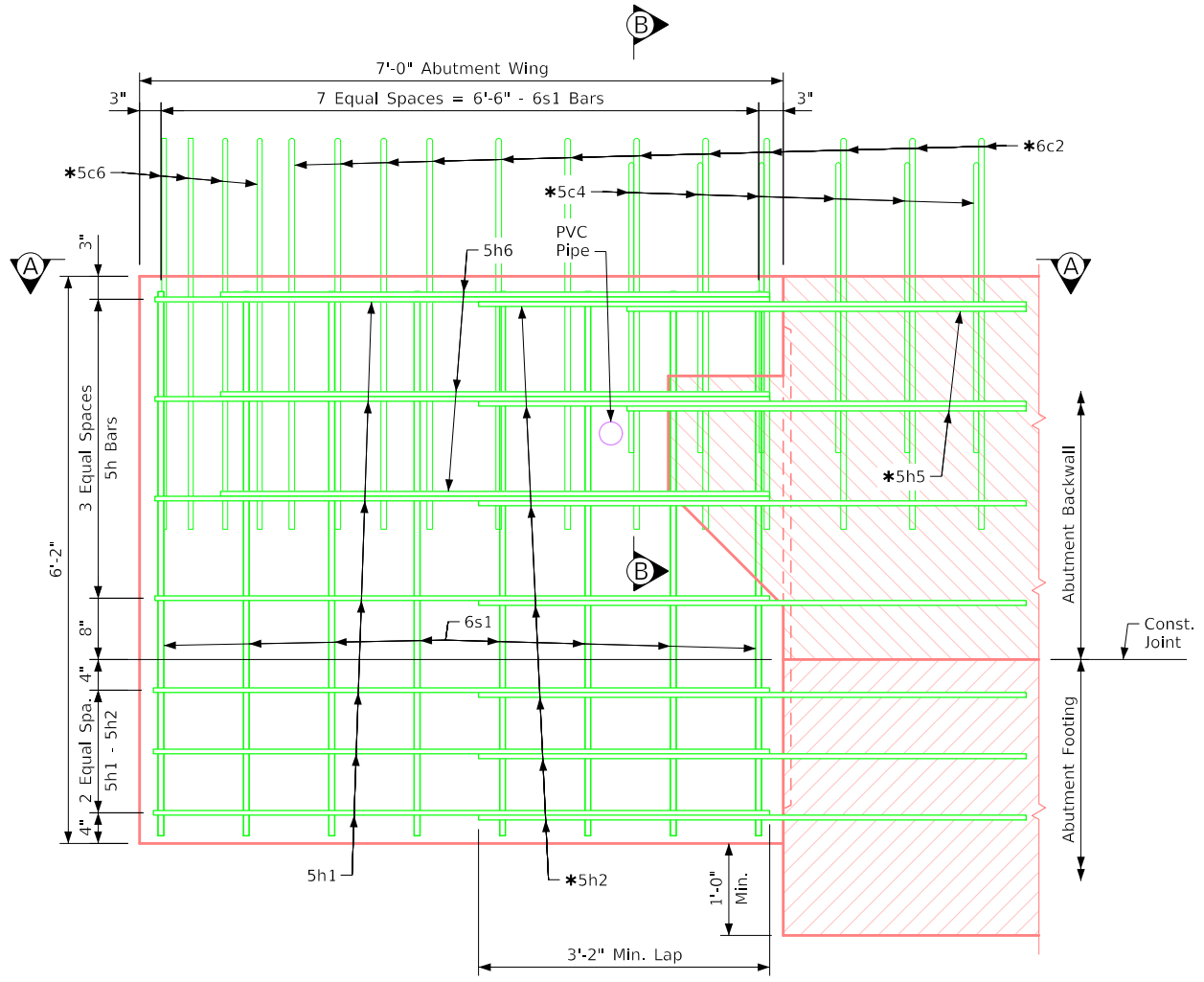
Bent Bar Details

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

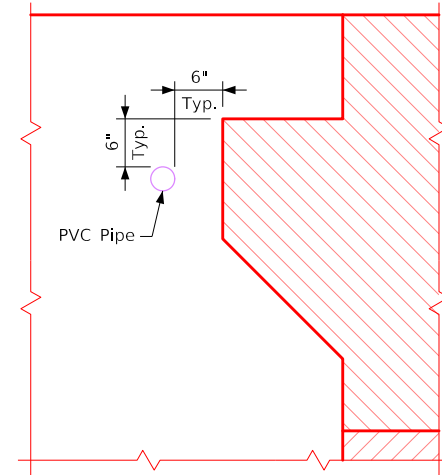
Concrete Placement Summary

Section	Total
One Abutment Wing	2.5
Total (cu. yds.)	2.5

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



Abutment Wing - Elevation View



PVC Pipe Location

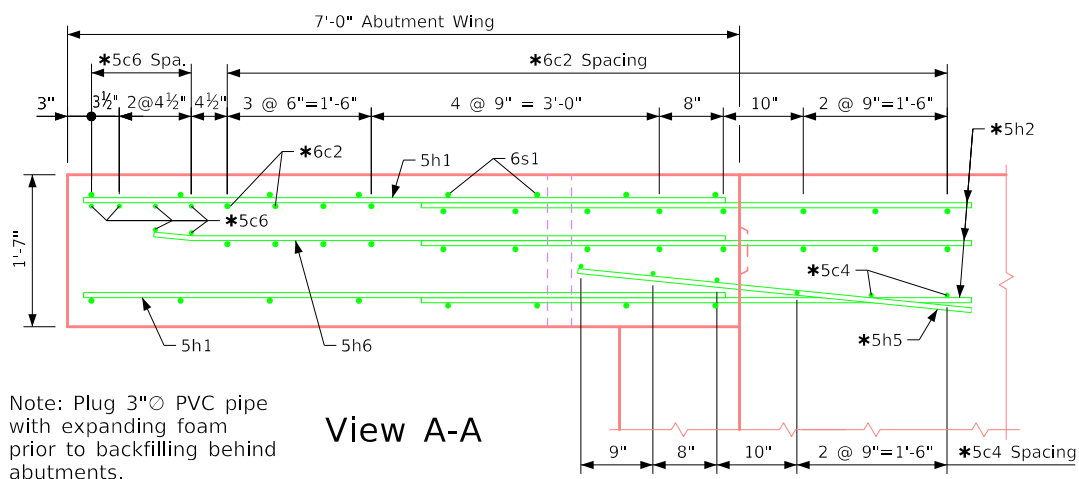
Note: Plug 3" PVC pipe with expanding foam prior to backfilling behind abutments.

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.



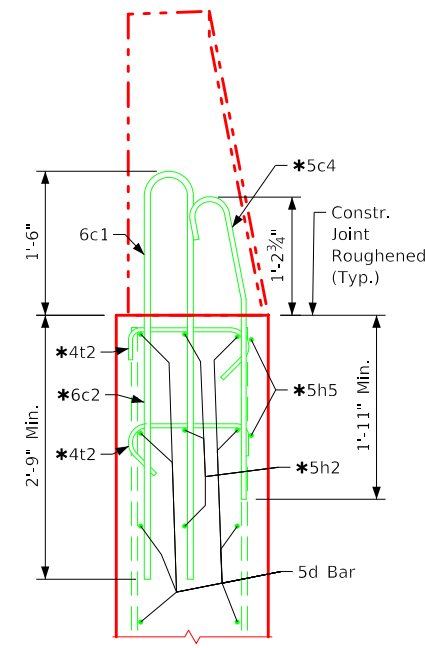
Integral Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2110 - This Sheet Re-Issued 11-2023. Sheet Format Update.



View A-A

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



Section B-B

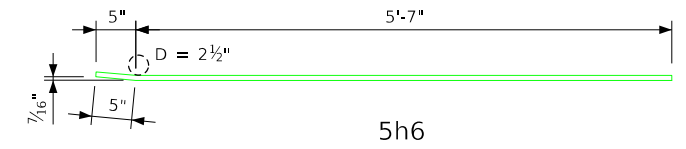
*Barrier rail end section bars to be placed with abutment wing and abutment.

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.

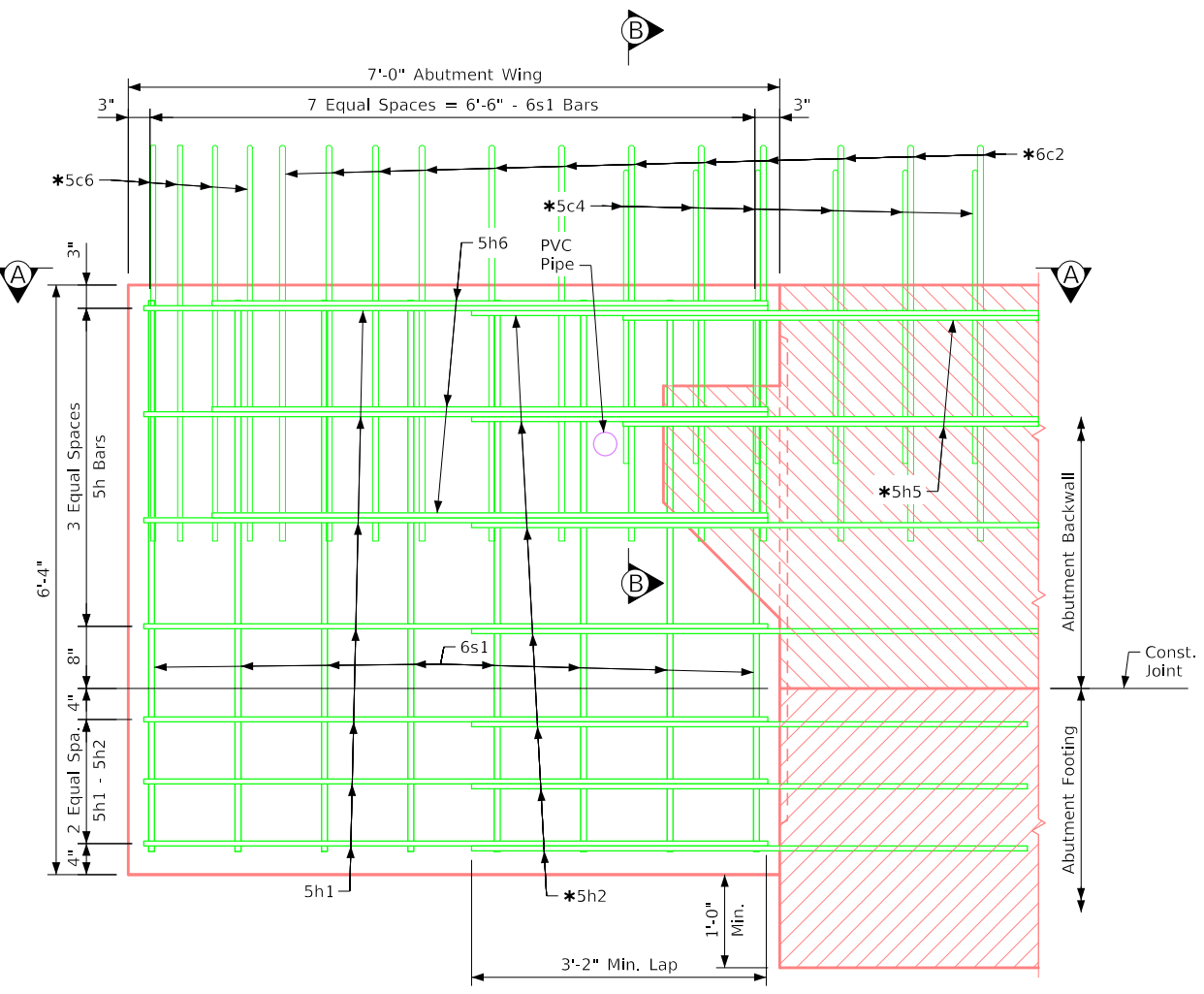
Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		14	6'-8"	97
5h6	Horizontal Wingwall		3	6'-0"	19
6s1	Vertical Both Faces		16	6'-0"	144
Epoxy Reinforcing Total Weight (lbs.)					260



Bent Bar Details

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

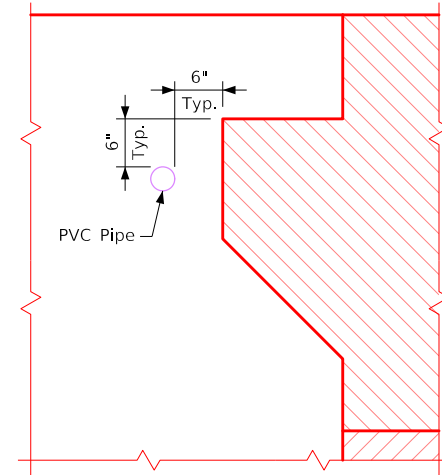


Abutment Wing - Elevation View

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.



PVC Pipe Location

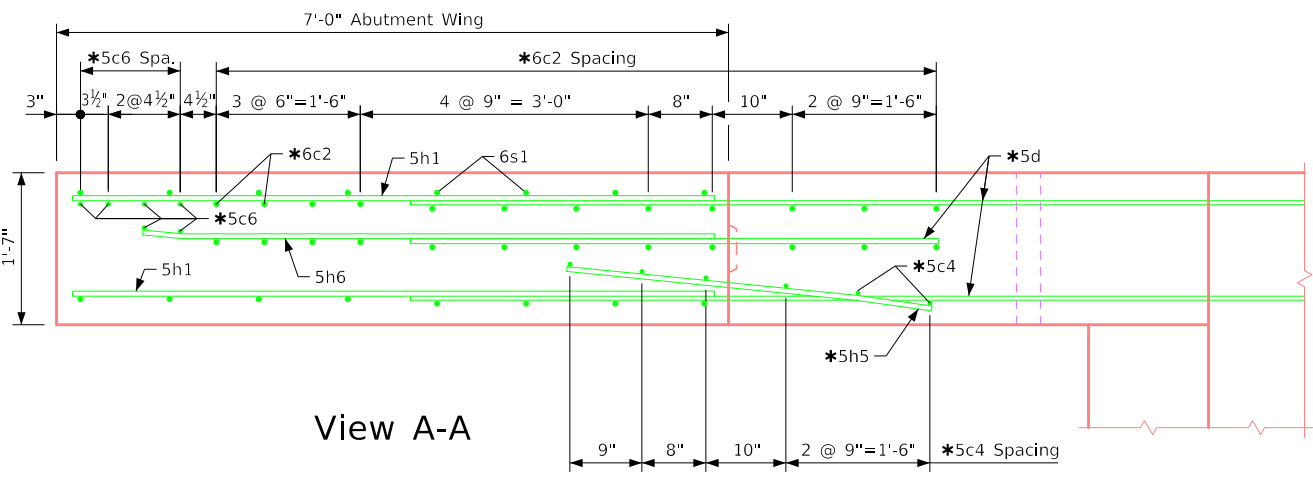
Note: Plug 3" PVC pipe with expanding foam prior to backfilling behind abutments.

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.

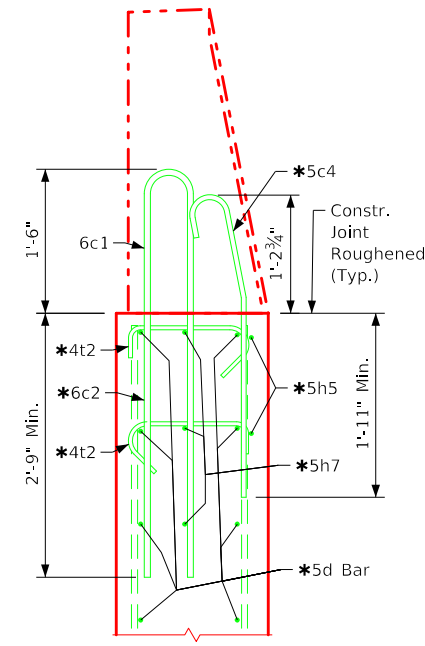


Integral Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2111 - This Sheet Re-Issued 11-2023. Sheet Format Update.



View A-A



Section B-B

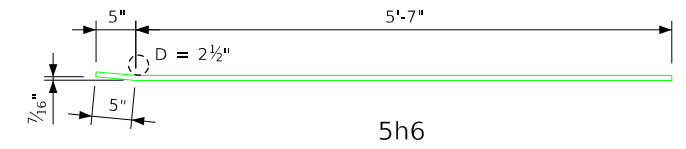
*Barrier rail end section bars to be placed with abutment wing and abutment.

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		3	6'-0"	19
6s1	Vertical Both Faces		16	6'-11"	166
Epoxy Reinforcing Total Weight (lbs.)					310



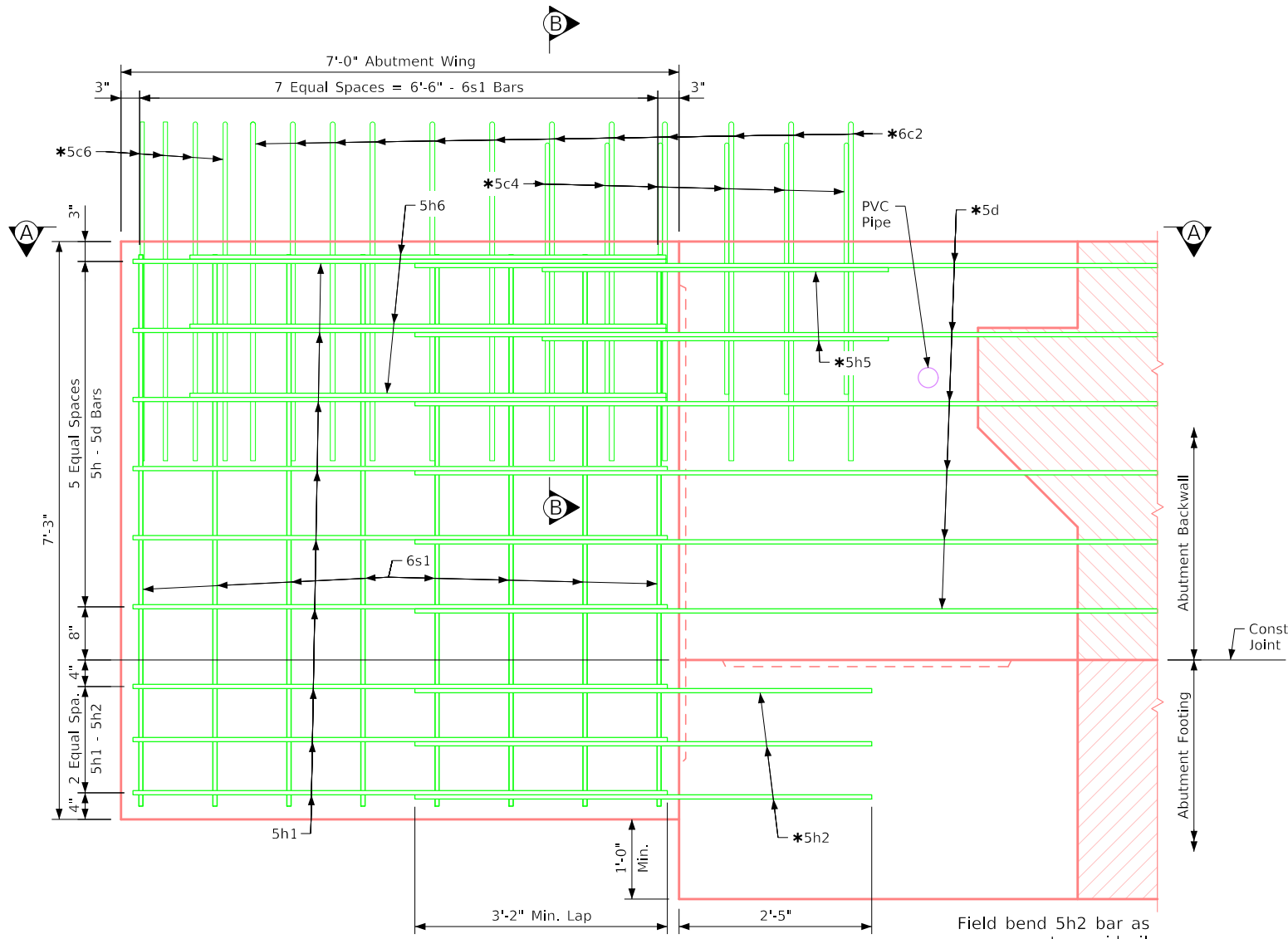
Bent Bar Details

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

Concrete Placement Summary

Section	Total
One Abutment Wing	3.0
Total (cu. yds.)	3.0

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

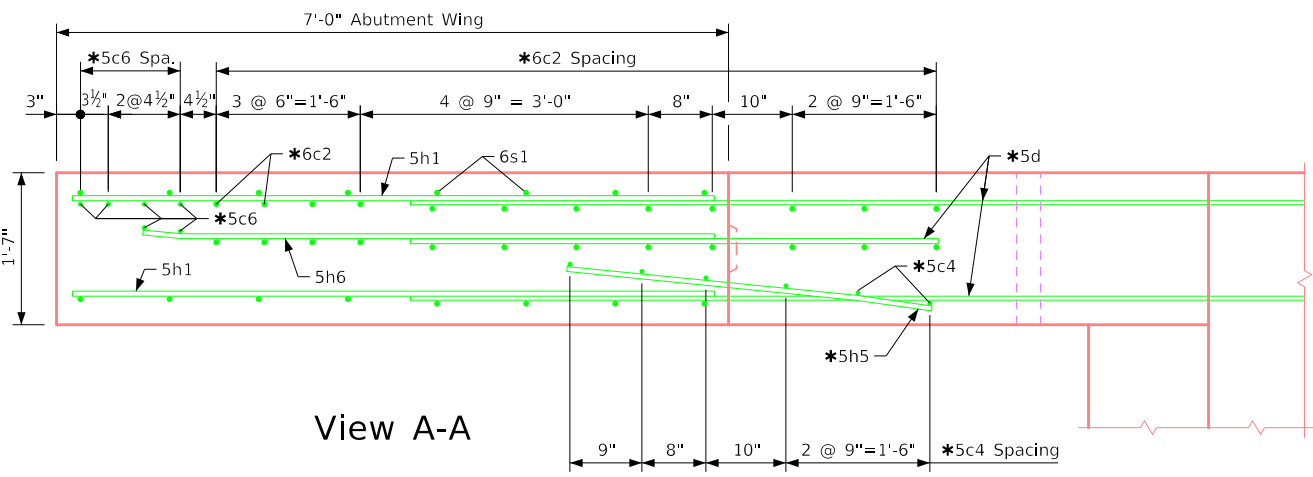


Abutment Wing - Elevation View

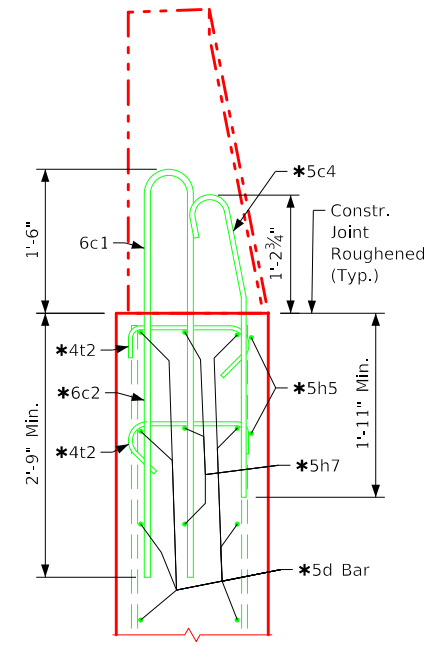
NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Integral Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2112 - This Sheet Re-Issued 11-2023. Sheet Format Update.



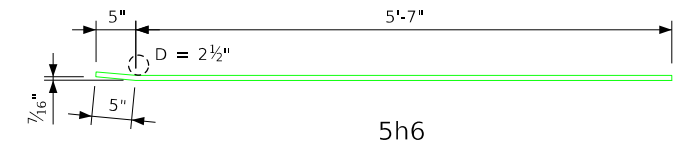
View A-A



Section B-B

Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		18	6'-8"	125
5h6	Horizontal Wingwall		3	6'-0"	19
6s1	Vertical Both Faces		16	7'-7"	182
Epoxy Reinforcing Total Weight (lbs.)					326



Bent Bar Details

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

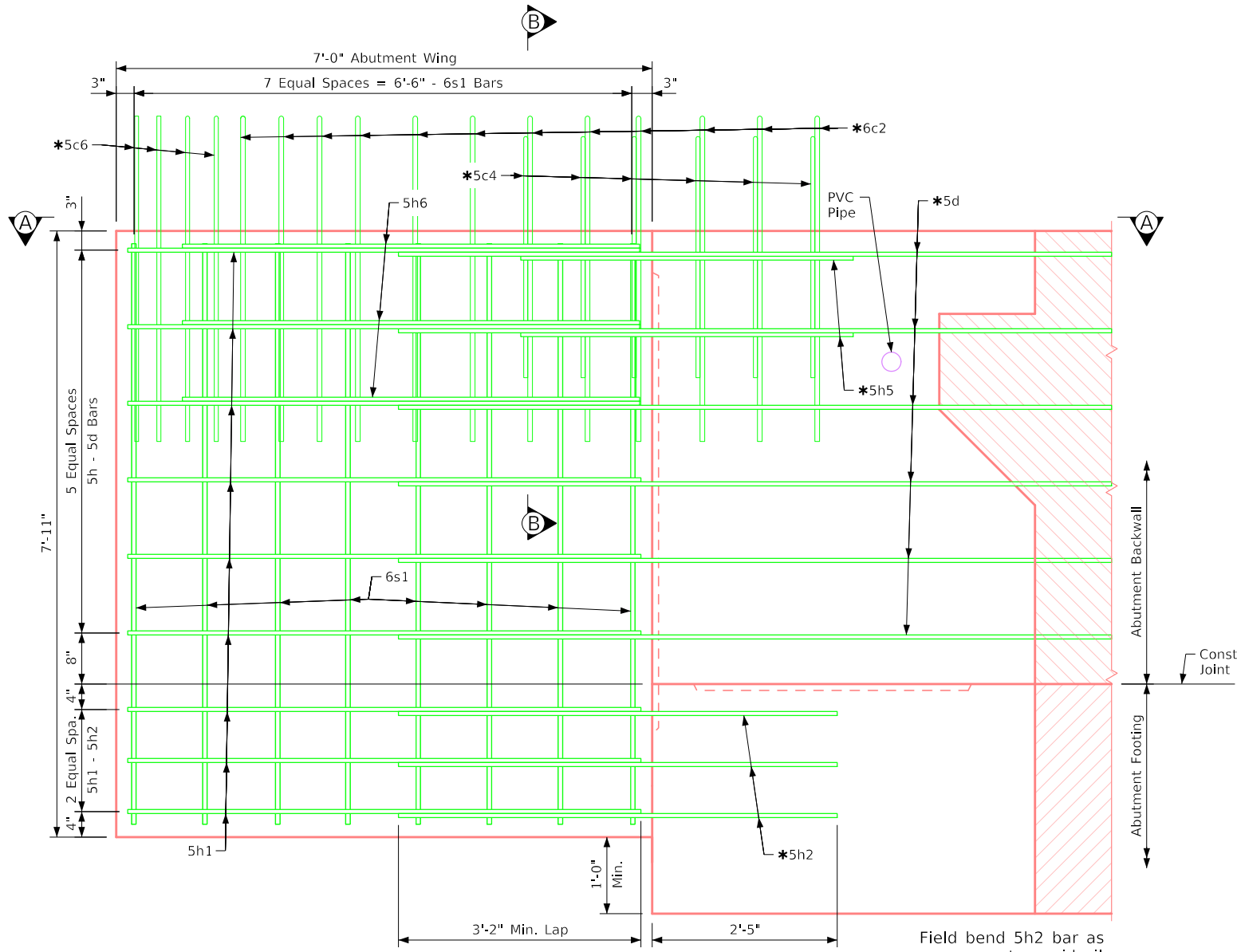
*Barrier rail end section bars to be placed with abutment wing and abutment.
See Barrier Rail End Section Sheet on Design Sheet No. ?? for details of reinforcing bars 6c2, 5c4, 5c6 and 4t2.

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

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.

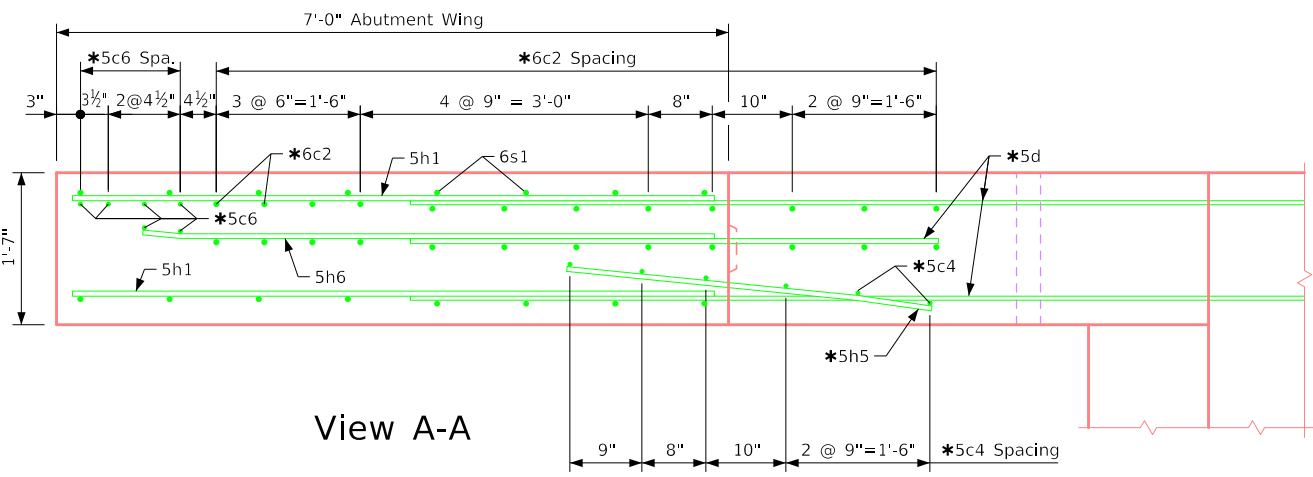


Abutment Wing - Elevation View

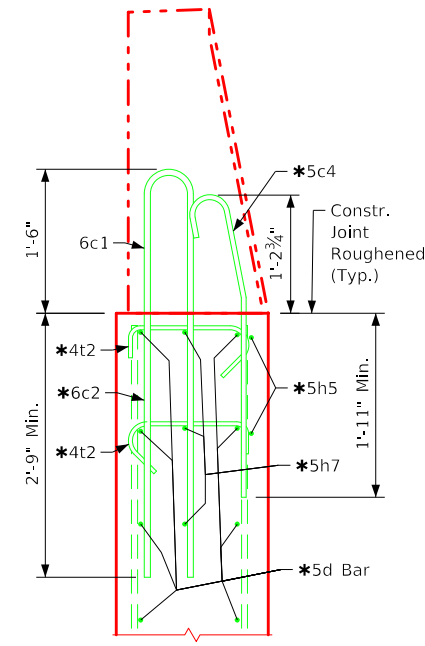
NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Stub Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet.
Issued 02-08.
MiscellaneousBridges.dgn - 2112-S - This Sheet Re-Issued 11-2023. Sheet Format Update.



View A-A

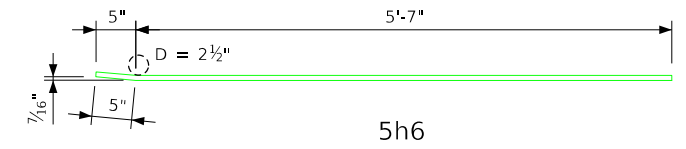


Section B-B

*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.

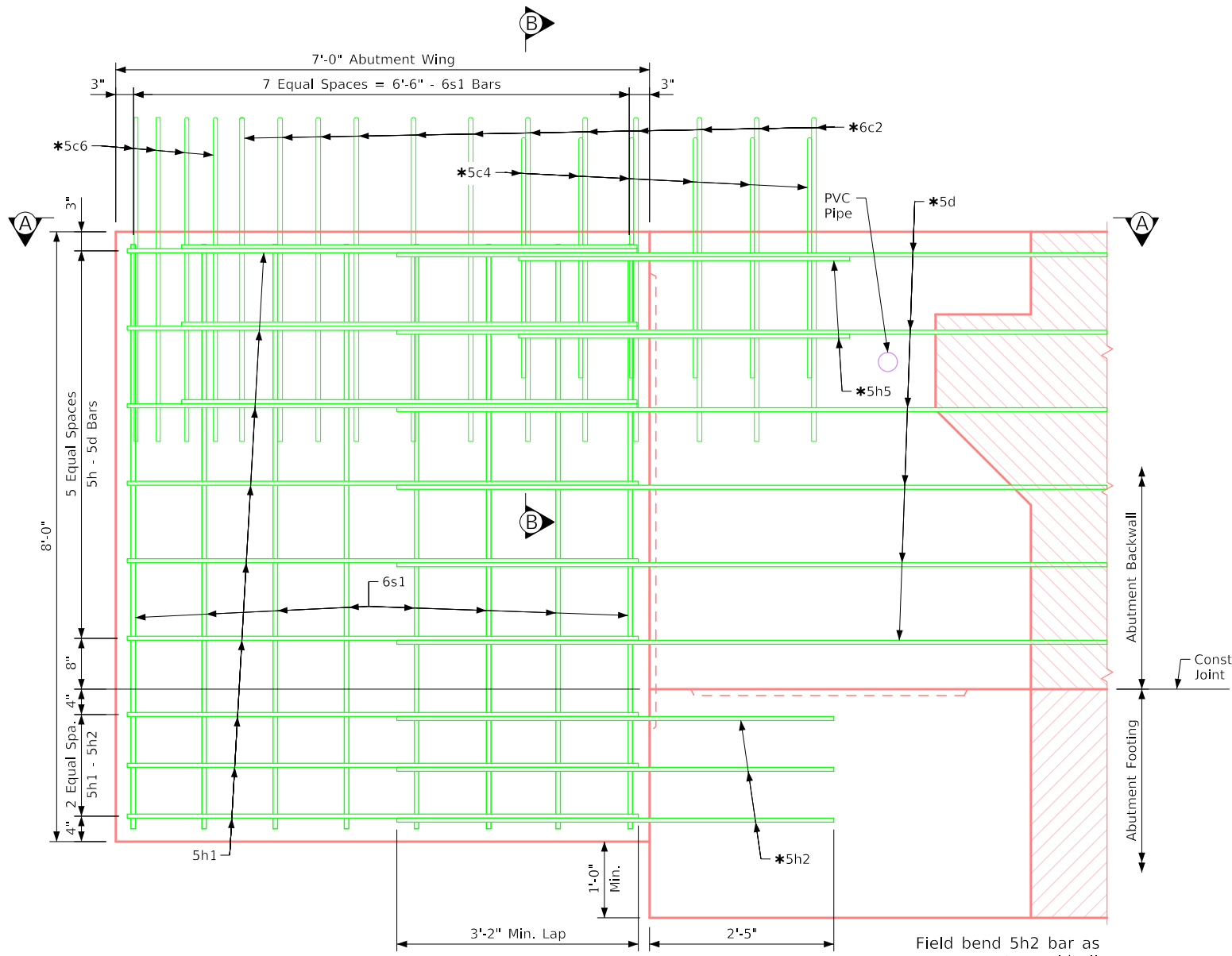
Reinforcing Bar List - One Abut. Wing

Bar	Location	Shape	No.	Length	Weight
5h1	Horizontal Both Faces		18	6'-8"	125
5h6	Horizontal Wingwall		3	6'-0"	19
6s1	Vertical Both Faces		16	7'-8"	184
Epoxy Reinforcing Total Weight (lbs.)					328



Bent Bar Details

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



Abutment Wing - Elevation View

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

Concrete Placement Summary

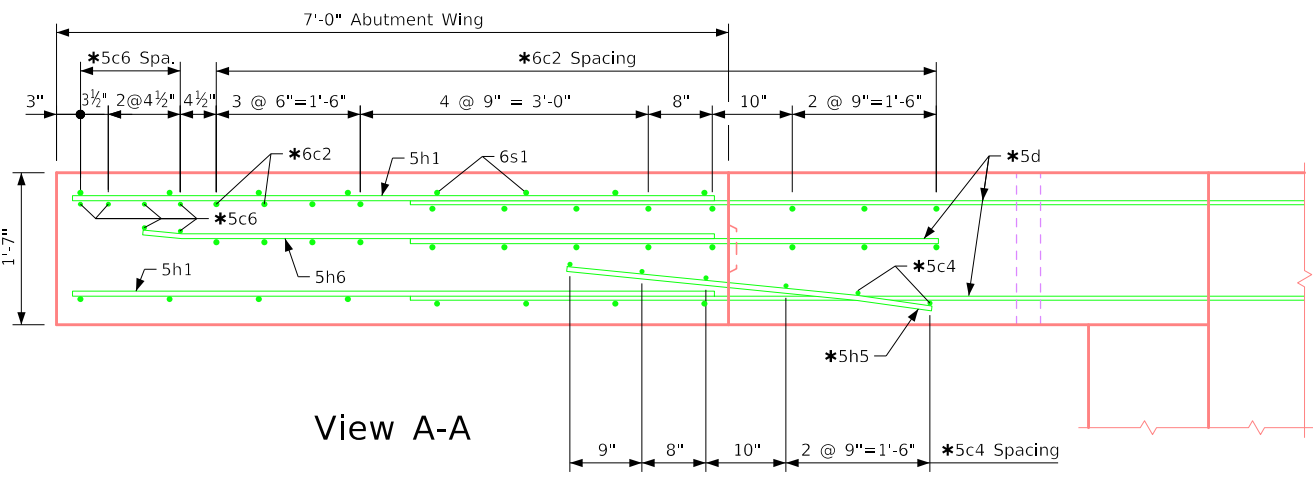
Section	Total
One Abutment Wing	3.3
Total (cu. yds.)	3.3

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

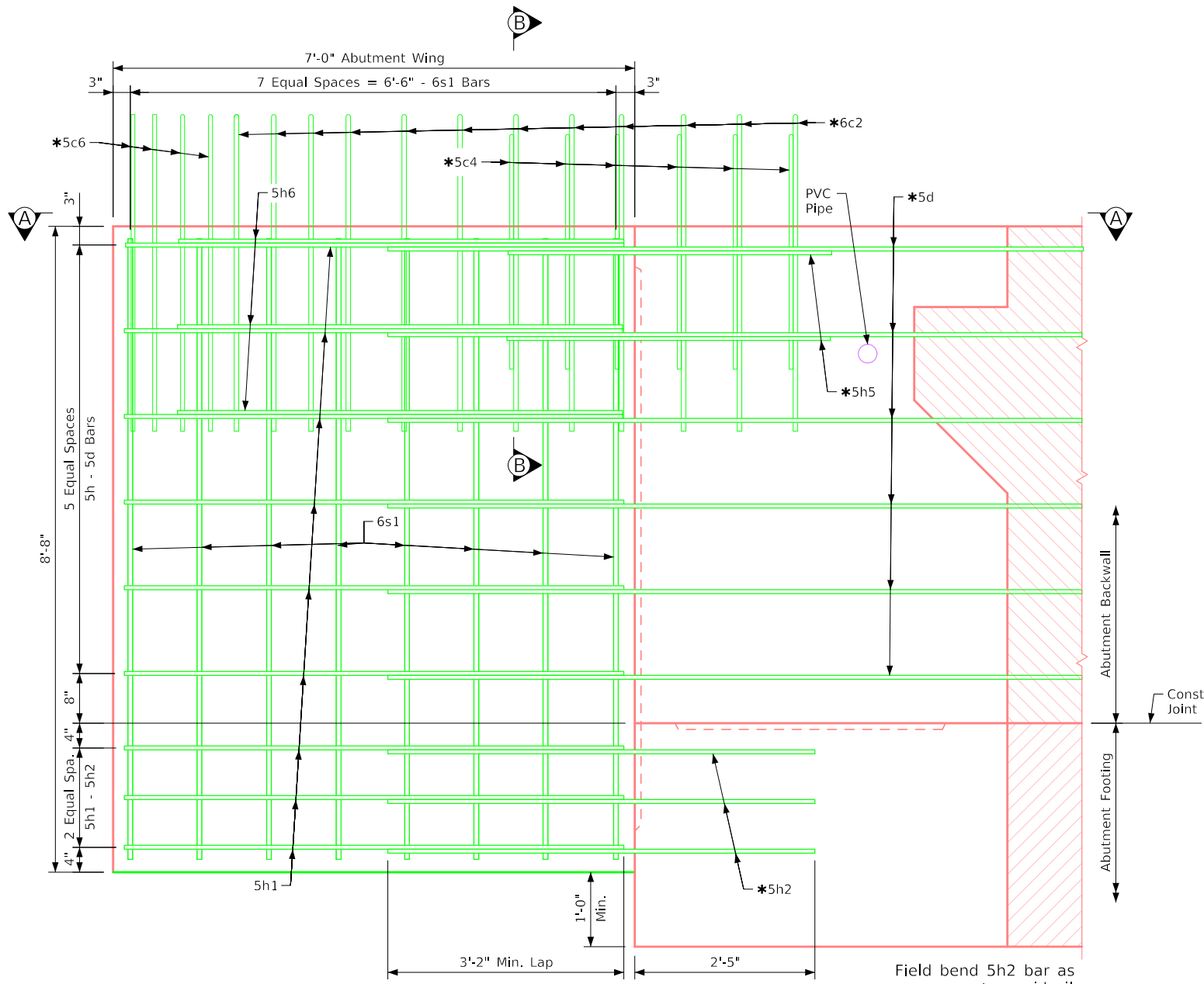
NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Integral Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2113 - This Sheet Re-Issued 11-2023. Sheet Format Update.

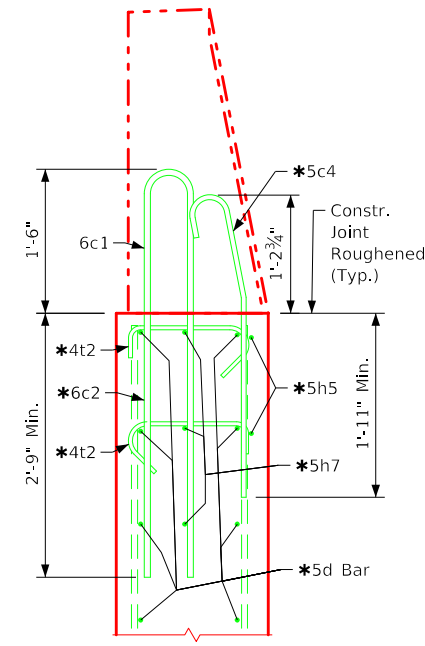


View A-A



Abutment Wing - Elevation View

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



Section B-B

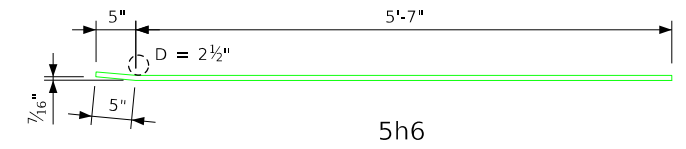
*Barrier rail end section bars to be placed with abutment wing and abutment.

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		3	6'-0"	19
6s1	Vertical Both Faces		16	8'-4"	200
Epoxy Reinforcing Total Weight (lbs.)					344



5h6

Bent Bar Details

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

Concrete Placement Summary

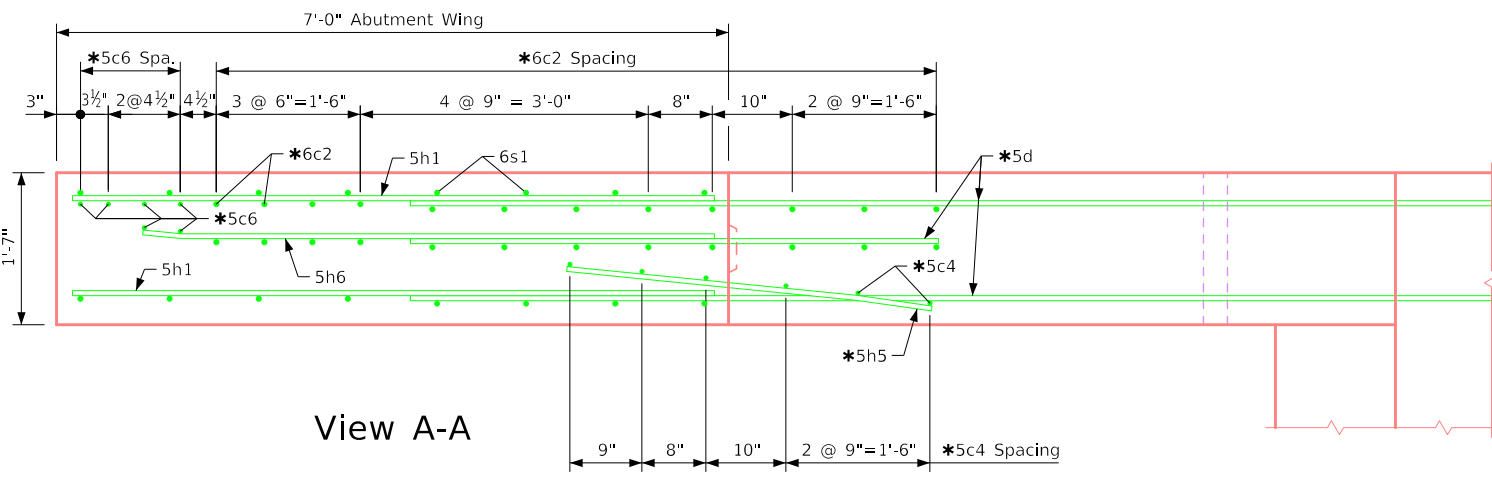
Section	Total
One Abutment Wing	3.6
Total (cu. yds)	3.6

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

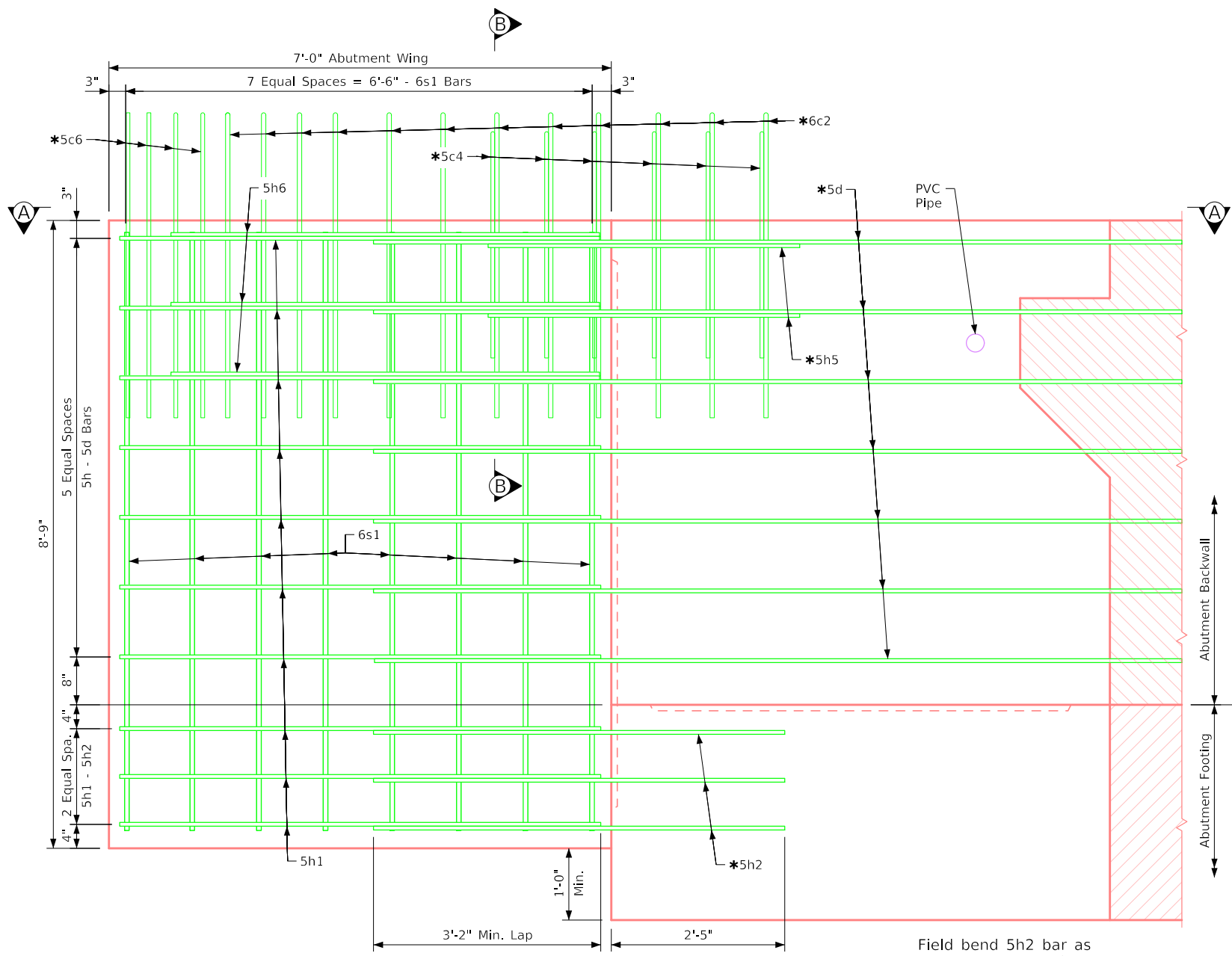
NOTE: "PC_REBAR_STAINLESS" level or "PC_REBAR_EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Stub Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2113-S - This Sheet Re-Issued 11-2023. Sheet Format Update.

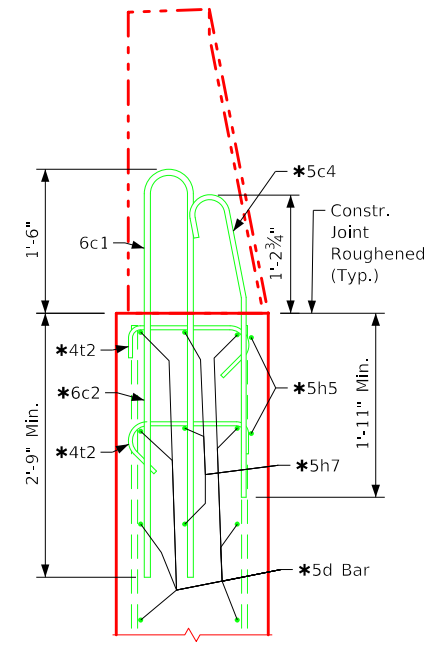


View A-A



Abutment Wing - Elevation View

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



Section B-B

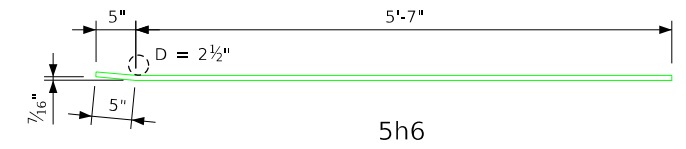
*Barrier rail end section bars to be placed with abutment wing and abutment.

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		3	6'-0"	19
6s1	Vertical Both Faces		16	8'-5"	202
Epoxy Reinforcing Total Weight (lbs.)					360



5h6

Bent Bar Details

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

Concrete Placement Summary

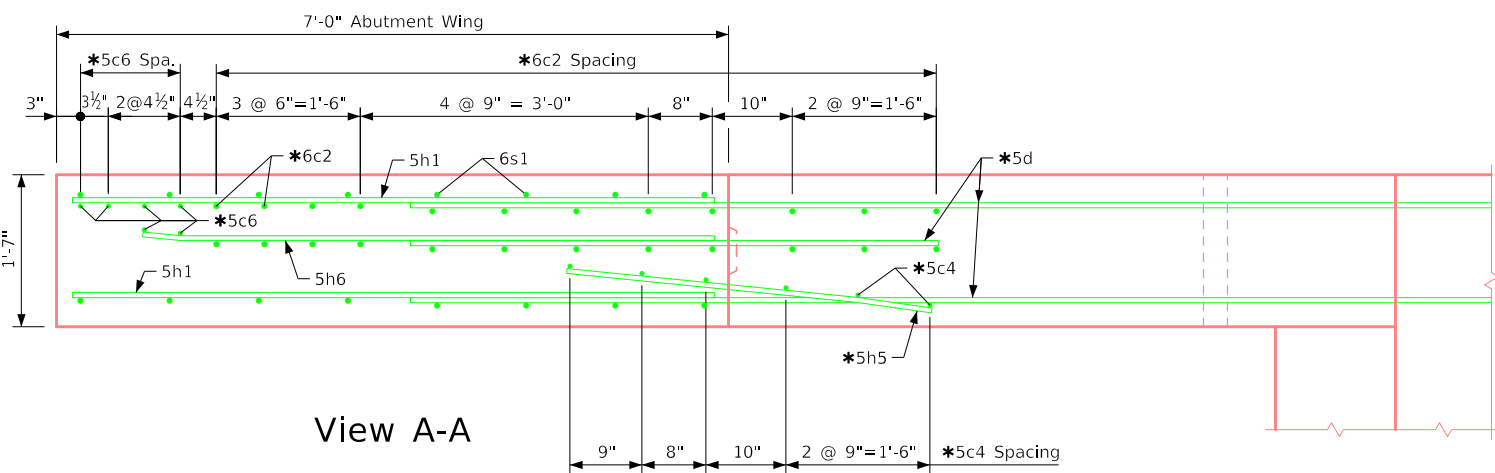
Section	Total
One Abutment Wing	3.6
Total (cu. yds.)	3.6

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

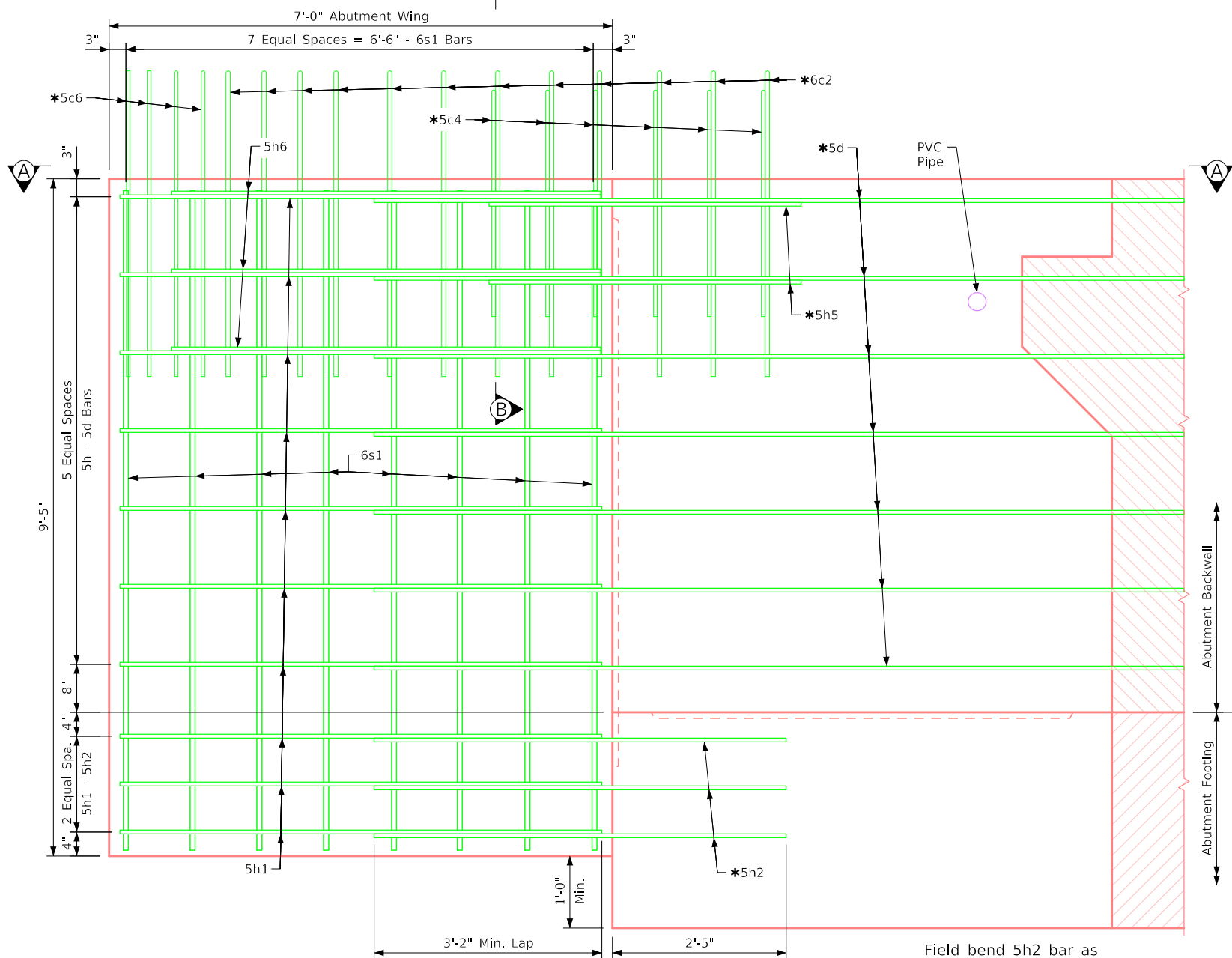
NOTE: "PC REBAR STAINLESS" level or "PC REBAR EPOXY" level should be ON or OFF in the referenced rebar details depending on barrier rail steel embedded in the bridge deck.

Integral Abutment Wing Details

Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2114 - This Sheet Re-Issued 11-2023. Sheet Format Update.

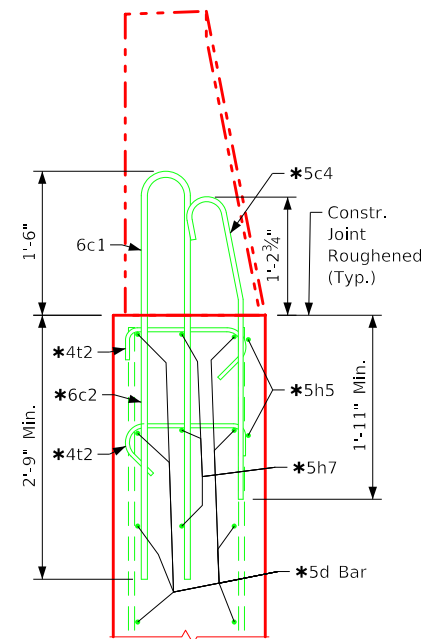


View A-A



Abutment Wing - Elevation View

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



Section B-B

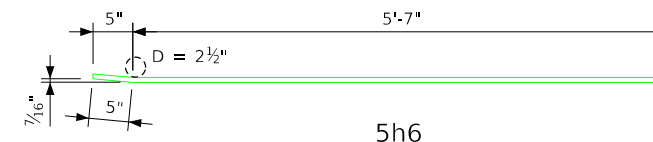
*Barrier rail end section bars to be placed with abutment wing and abutment.

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		3	6'-0"	19
6s1	Vertical Both Faces		16	9'-1"	218
Epoxy Reinforcing Total Weight (lbs.)					376



Bent Bar Details

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

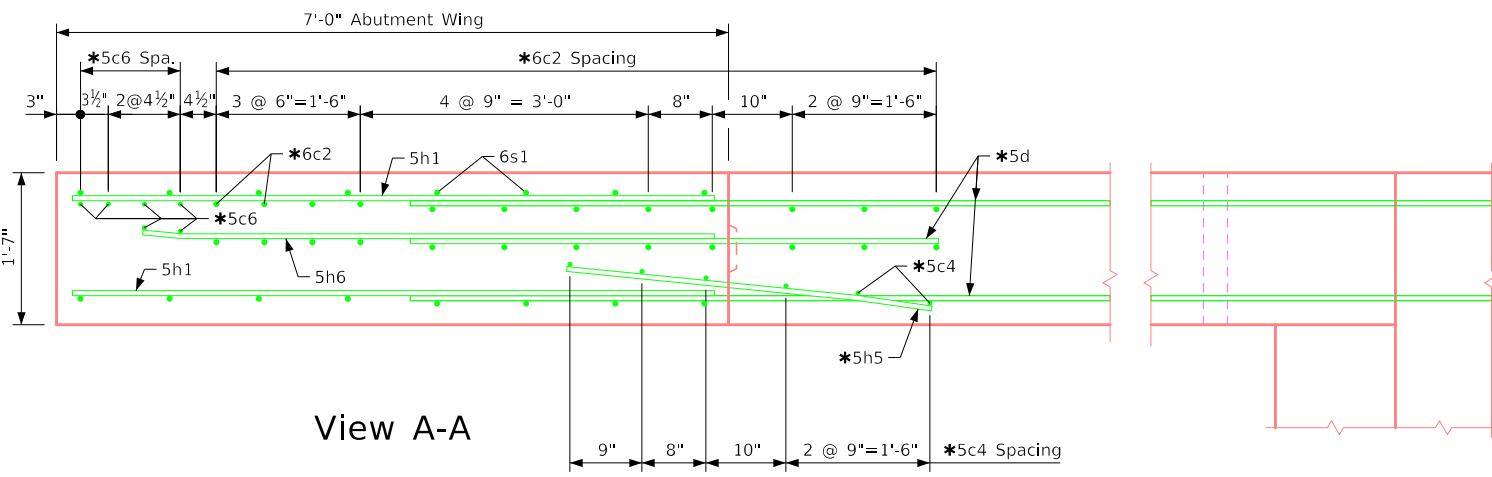
Concrete Placement Summary

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

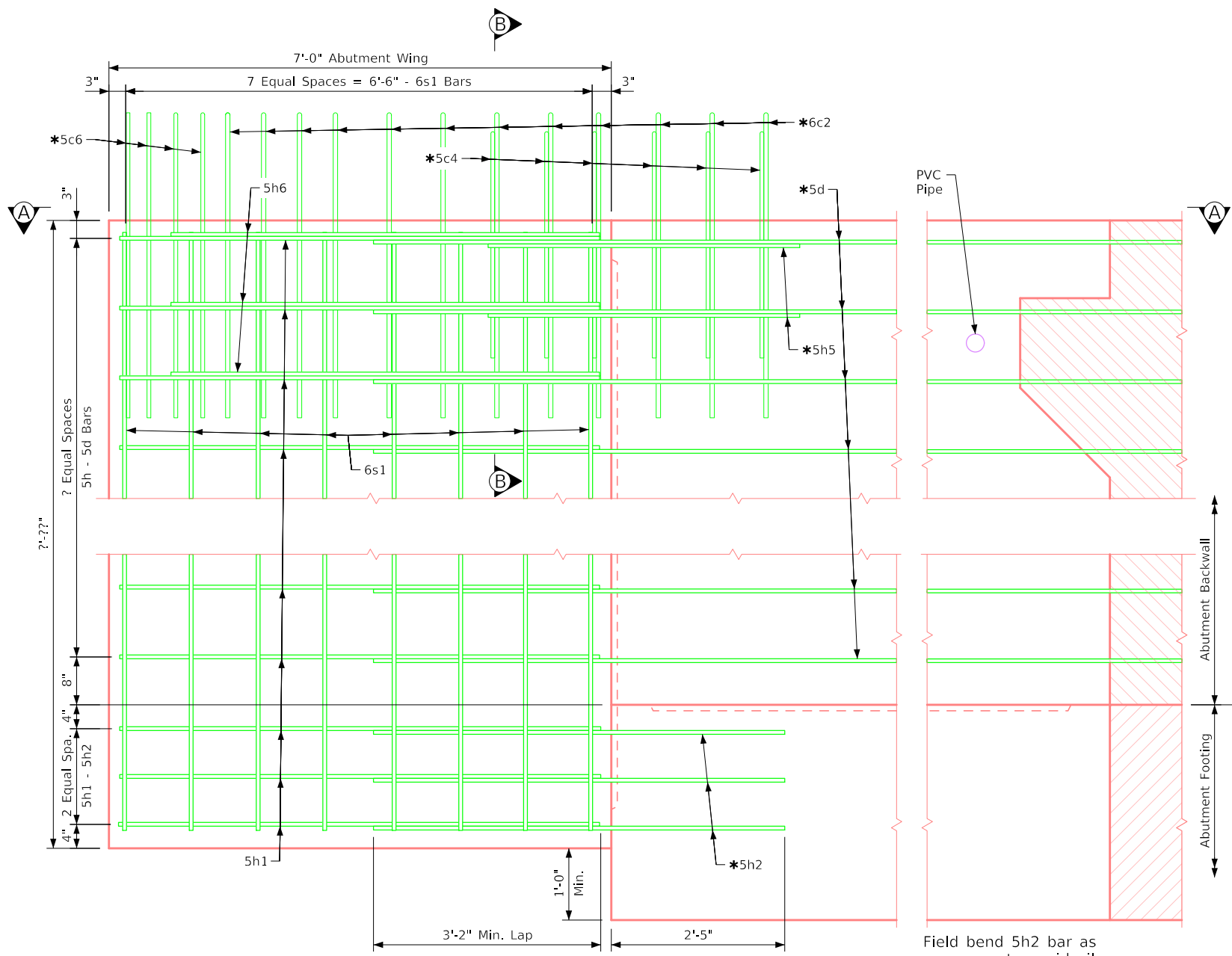
Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

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.

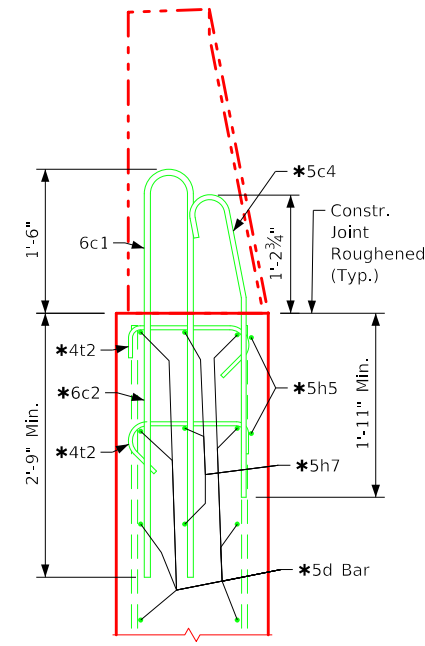
Stub Abutment Wing Details



View A-A



Abutment Wing - Elevation View

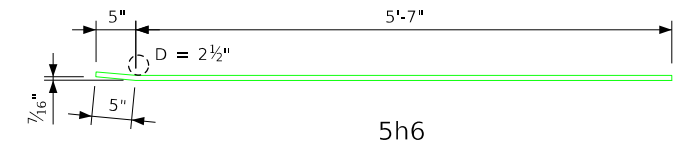


Section B-B

*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		???	6'-8"	???
5h6	Horizontal Wingwall		3	6'-0"	19
6s1	Vertical Both Faces		16	???	???
Epoxy Reinforcing Total Weight (lbs.)					???



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.)	???

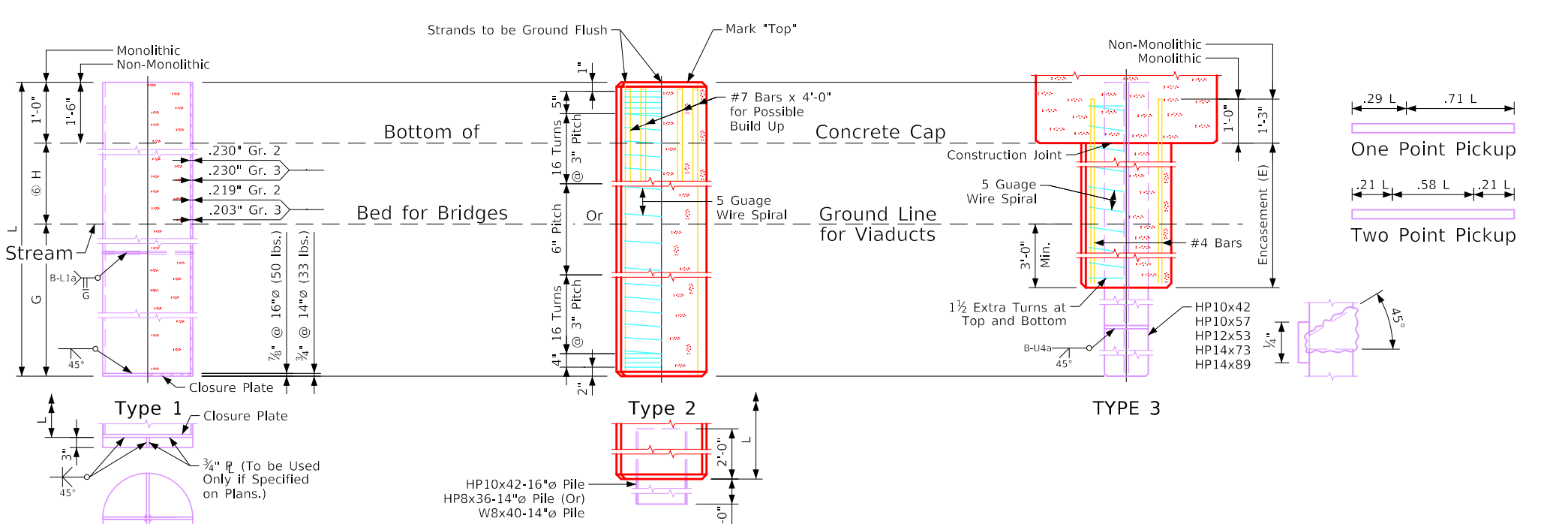
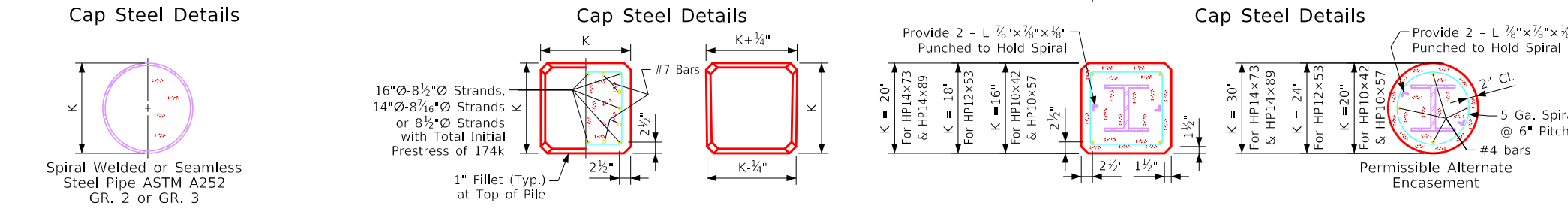
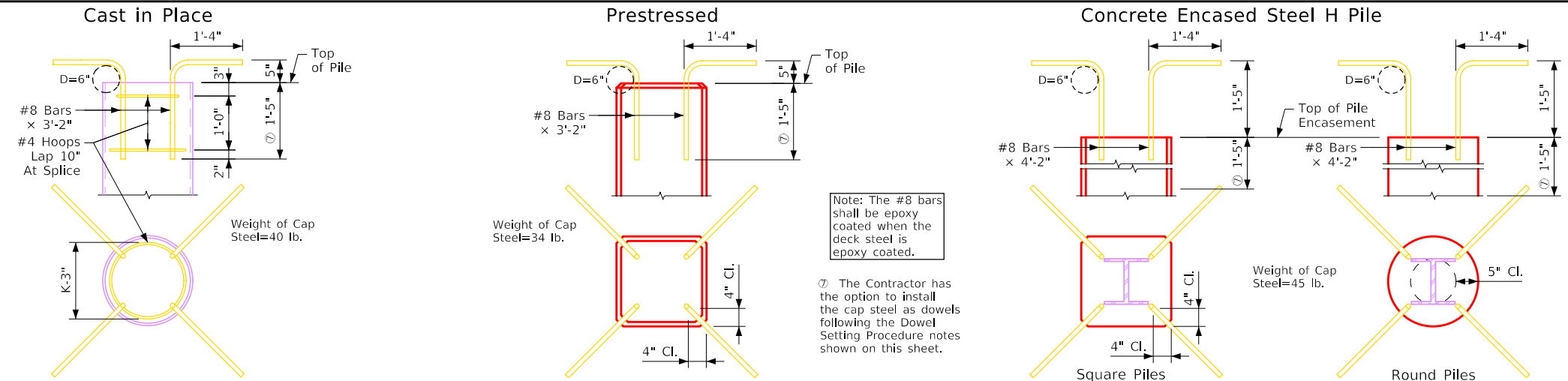
Note: Concrete and reinforcing steel quantities are included on the Summary Quantities Sheet.

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.



Correction 04-14: Added Referral Note to Summary Quantities Sheet. Issued 02-08. MiscellaneousBridges.dgn - 2115 - This Sheet Re-Issued 11-2023. Sheet Format Update.

Revised 03-2022: Updated Spiral Requirements to ASTM A1054 Grade 70 (was ASTM A82).
 Issued 01-09.
 MiscellaneousBridges.dgn - P10L - This Sheet Re-Issued 11-2023. Sheet Format Update.



Steel Driving Points

K Dimension	in	14Ø	16Ø
G Min. Below Ground	ft	24	27
6 H Max. Above Ground	ft	18	22

Shell ASTM A-252	Gr. 2	Gr. 3	Gr. 2	Gr. 3
Concrete (L=40')	1.49	1.49	1.95	1.95
Concrete 1' Change	0.0372	0.0373	0.0488	0.0488
1 Wt. of Shell (L=40')	1325	1231	1600	1600
Wt. of Shell 1' Change	32.26	29.94	38.77	38.77
f'c	4.0	4.0	4.0	4.0
5 Nominal Resistance Pn	119	119	137	137

Strand Strength

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

Steel H Pile

	HP10x42	HP10x57	HP12x53	HP14x73	HP14x89
G Min. Below Ground	ft 18	ft 18	ft 21	ft 24	ft 24
6 H Max. Above Ground W/ Monolithic	ft 19	ft 19	ft 23	ft 28	ft 29
6 H Max. Above Ground W/ Non-Monolithic	ft 15	ft 16	ft 20	ft 25	ft 26
Concrete (E=18')	cy 1.12	cy 1.10	cy 1.41	cy 1.74	cy 1.72
Concrete 1' Change	cy 0.062	cy 0.061	cy 0.078	cy 0.097	cy 0.096
4 Reinforcing (E=18')	lb 96	lb 96	lb 99	lb 103	lb 103
4 Reinforcing 1' Change	lb 4.98	lb 4.98	lb 5.13	lb 5.28	lb 5.28
Concrete (E=18')	cy 1.40	cy 1.38	cy 2.02	cy 3.17	cy 3.15
Concrete 1' Change	cy 0.078	cy 0.076	cy 0.112	cy 0.176	cy 0.175
4 Reinforcing (E=18')	lb 97	lb 97	lb 102	lb 110	lb 110
4 Reinforcing 1' Change	lb 5.02	lb 5.02	lb 5.26	lb 5.62	lb 5.62
5 Nominal Resistance Pn	kips 154	kips 208	kips 192	kips 265	kips 324

f'c = 4.0 ksi

General Notes:

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 and pile size required shall in all cases be as specified on the plans.
 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.
 Cost of all driving points and cap steel is to be included in the price bid per linear foot for piling.
 Wire spiral shall conform to ASTM A1064 Grade 70.

Cast in Place Pile Notes:

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.

Prestressed Pile Notes:

Except as otherwise noted all exposed corners 90° or sharper shall be filleted 3/4".
 Driving points for prestressed piles, if called for on the plans, shall be as detailed.

Bidding Notes:

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.

Dowel Setting Procedure:

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.
 - Drill hole approximately twice the diameter of the dowel bar and to the depth indicated.
 - Fill hole with water and allow to stand long enough to thoroughly saturate the surrounding concrete (about four hours).
 - Blow out all free water and fill hole 2/3 full of mortar.
 - Insert dowel by driving, if necessary, and manipulate or tap with a hammer to consolidate mortar and secure complete embedment.
 - Add more mortar, if necessary, to fill hole.
 - Mortar shall consist of equal parts portland cement and sand with just enough water to make a workable mix.

Approved By: 
 Bridge Engineer

Latest Revision
 Date: 11-2023

LRFD Trestle Pile Bents - P10L