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J40-25 Bridge Standards – General Notes

The J40-25 Bridge Standards, if properly used, provide the structural plans necessary to construct 3-span 40'-0" roadway continuous concrete slab bridges with lengths of 70, 80, 90, 100, 110, 120, 130, 140 and 150ft.

These bridges may be built on a 0°, 15°, 30° or 45° skew. These plans show the bridges skewed in one direction, but all dimensions and details would be the same for the opposite skew.

These standards give most of the information necessary to build these bridges. However, the following additional information is required for use on primary routes. For secondary routes the Engineer may not require all sheets to be provided:

1. Title Sheet With Engineer's Seal
2. Estimated Quantities Totals Including Bid Item "Class 20 Excavation" for Bridge
3. Situation Plan Layout of Bridge
4. Top of Slab Elevations Layout
5. Bottom of Abutment Footing Elevations
6. Bottom of Pier Cap Elevations
7. Piling Design Information
8. Slope Protection Layout (if needed)
9. Conduit Layout
10. Lighting Layout (if needed)

For clarity, most sections shown on the following sheets are drawn with single slope barrier rail only. These sections will be identical for open rail barriers with any modifications shown on Open Rail Barrier Details Sheet J40-52-25 and Open Rail Barrier Quantities Sheet J40-53-25.

Note, that when approach pavement is to be placed, the temporary paving blocks shall be removed. The abutments for these bridges are built integral with the superstructure. Therefore, it is important that a proper joint for expansion be provided. The BR-205 double reinforced 12-inch approach standard road plan shall be used with the J40 Standards. This standard ties the approaches to the integral (movable) abutment and provides expansion movement (BE joint) at the end of the first approach slab panel.

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

The floor slab as shown includes 3/4-inch integral wearing surface.

All laps and development lengths are conservatively based on epoxy coated reinforcement regardless of reinforcement type.

The abutment design utilized on these bridges restricts their use in the following manner:

(1) These bridges are not to be used when point bearing for the abutment steel piling would be obtained on rock at a distance less than 27 ft. from the bottom of the abutment footing without any prebore and at a distance of less than 34 ft. from the bottom of the abutment footing when there is 10 ft. of prebore. A special analysis is required to use steel piling at the abutment, if point bearing occurs at a shallower depth.

(2) For the 140 ft. and 150 ft. long bridges the abutment piling are to be driven through oversized holes prebored to a minimum of 10 ft. below the bottom of footing. The prebored holes shall be in accordance with Section 2501.03,Q of the Standard Specifications. The elevation of the bottom of the prebored hole shall be shown on the plans.

The piers and abutments for these standards have been designed for the use of both friction and point bearing piles. It is necessary that the type and length for both the abutment and pier piles be designated on the front sheet of the plans.

The integral abutments and pile bents for these J40 Standards have been designed for the use of various types of pile footings as follows.

- Integral abutments: Timber piles or HP 10x42 piles at Bridge Design Manual (BDM) Article 6.2.6.1 Structural Resistance Level-1 (SRL-1)
- Pile Bents: Standard concrete-filled steel pipe piles (P10L), Standard prestressed concrete piles (P10L), or Standard H-piles (P10L and SRL-1)

For pile foundations the Designer will need to determine the construction control method, contract length, and driving target and give that information on the front sheet of the plans. Bridge Design Manual CADD notes E718, E719, E818, and E819 are appropriate for that purpose. The notes, as well as the Bridge Design Manual and design examples, are available on the Bridges and Structures Bureau web site.

For more information on SRL-1, see the Bridge Design Manual, located on the Iowa Department of Transportation, Bridges and Structures Bureau web site. For piers subject to scour the design bearing shall be obtained below scour elevation. Scour elevation shall be shown on the front sheet.

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

Specifications:

Design: AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.
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 LRFD Bridge Design Specifications, 10th Ed., Series of 2024.

Reinforcing steel in accordance with LRFD AASHTO Section 5, Grade 60, for epoxy and non-coated bars, and Grade 60 or 75 for stainless steel reinforcing

Concrete in accordance with LRFD AASHTO Section 5, f'c = 4,000 psi,

Structural steel in accordance with LRFD AASHTO Section 6. ASTM A709 Grade 36 or Grade 50 (AASHTO M270 Grade 36 or Grade 50).

n = 8 for tension steel

2n = 16 for compression steel

HL-93 live load plus 20 lbs. per sq. ft. for future wearing surface.

End span length is used to calculate equivalent width in live load distribution.

Six foot of approach slab dead & live load included in abutment loads.

Control of cracking by distribution of reinforcement for slab design based on the AASHTO LRFD Bridge Design Specifications, 10th Ed., Series of 2024.

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

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

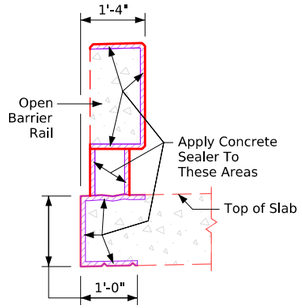
Continuous Concrete Slab Bridge

July, 2025

General Information, Notes & Sheet Index

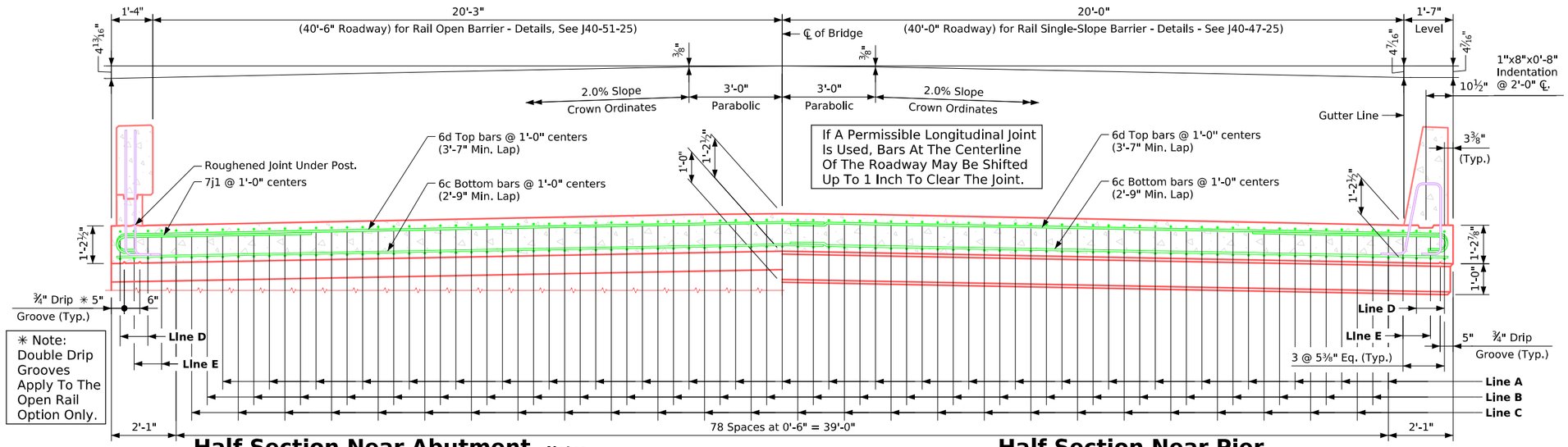
J40-01-25

Revised 09-2026: Updated Bridge Engineer signature. Updated J40-54-25 sheet title to "Wing Armoring & Erosion Stone Details" (was using Macadam Stone).



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.
The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



✳ Note: Double Drip Grooves Apply To The Open Rail Option Only.

Half Section Near Abutment

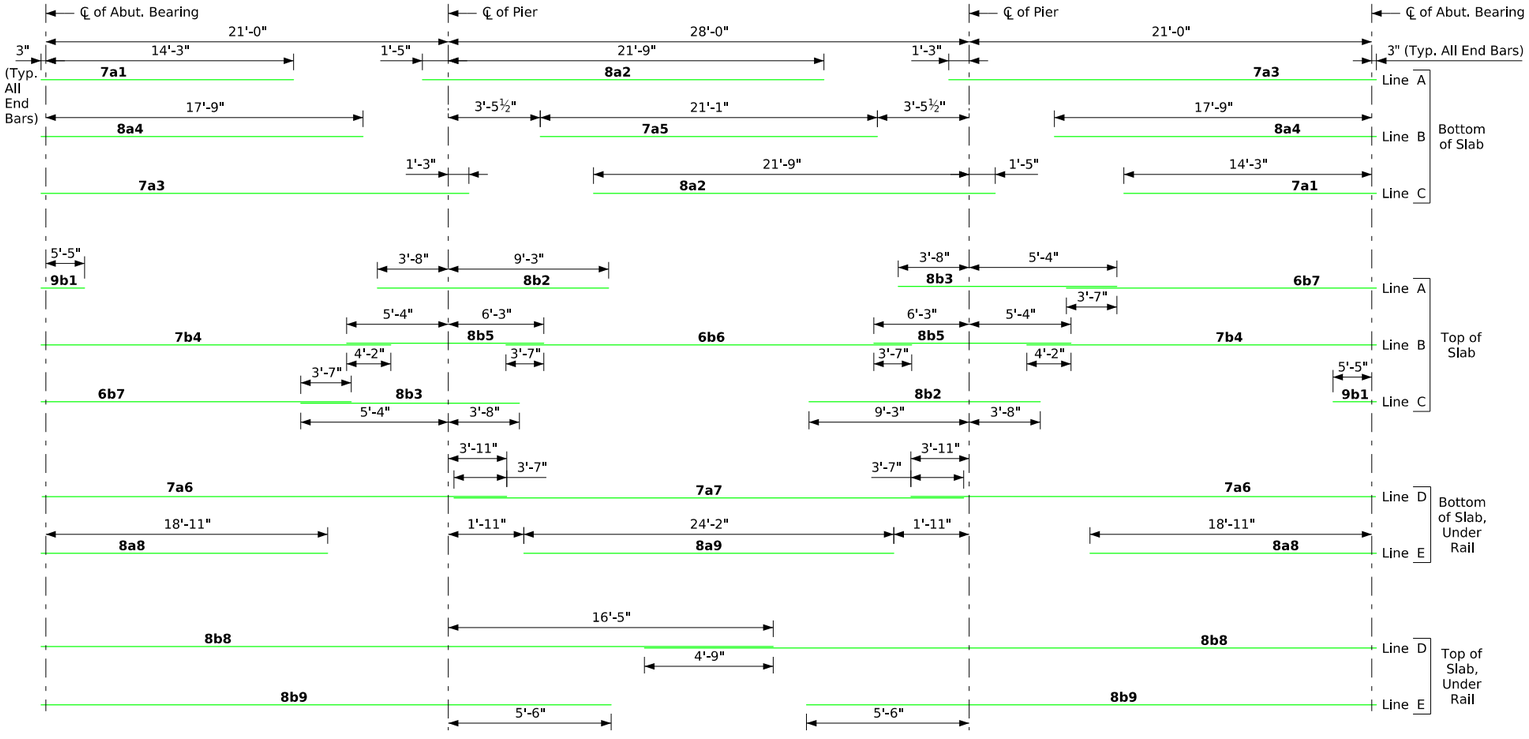
Slab Cross-Section Area For Open Rail = 52.16 sq. ft.

Half Section Near Pier

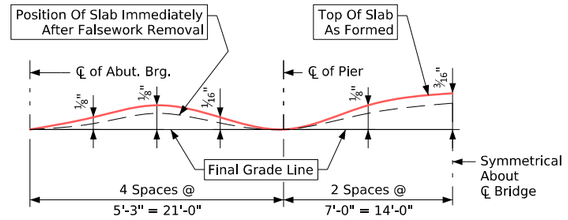
Slab Cross-Section Area For Single-Slope Barrier Rail = 52.21 sq. ft.

I.M. 451.01 Requirements Shall Apply For Bar Chairs.

Note:
Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.
Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.
Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.



70' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
70'-0" Bridge

J40-02-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note. Changed 8a9 bar length to 24'-2" (was 24'-3") and changed dimensions to pier centerline 1'-11" (was 1'-10½").

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Epoxy Steel Reinforcing for Superstructure-70' Bridge

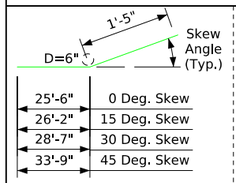
	Skew	0°				15°				30°				45°			
Location	Shape	Bar	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight			
Slab Longitudinal Bottom		7a1	53	14' - 6"	1571	53	14' - 6"	1571	53	14' - 6"	1571	53	14' - 6"	1571			
Slab Longitudinal Bottom		8a2	53	23' - 2"	3279	53	23' - 2"	3279	53	23' - 2"	3279	53	23' - 2"	3279			
Slab Longitudinal Bottom		7a3	53	22' - 6"	2438	53	22' - 6"	2438	53	22' - 6"	2438	53	22' - 6"	2438			
Slab Longitudinal Bottom		8a4	52	18' - 0"	2500	52	18' - 0"	2500	52	18' - 0"	2500	52	18' - 0"	2500			
Slab Longitudinal Bottom		7a5	26	21' - 1"	1121	26	21' - 1"	1121	26	21' - 1"	1121	26	21' - 1"	1121			
Slab Longitudinal Bottom, at Rail		7a6	8	25' - 2"	412	8	25' - 2"	412	8	25' - 2"	412	8	25' - 2"	412			
Slab Longitudinal Bottom, at Rail		7a7	4	27' - 4"	224	4	27' - 4"	224	4	27' - 4"	224	4	27' - 4"	224			
Slab Longitudinal Bottom, at Rail		8a8	8	19' - 2"	410	8	19' - 2"	410	8	19' - 2"	410	8	19' - 2"	410			
Slab Longitudinal Bottom, at Rail		8a9	4	24' - 3"	259	4	24' - 3"	259	4	24' - 3"	259	4	24' - 3"	259			
Slab Longitudinal Top		9b1	53	7' - 11"	1427	53	7' - 11"	1427	53	7' - 11"	1427	53	7' - 11"	1427			
Slab Longitudinal Top		8b2	53	12' - 11"	1828	53	12' - 11"	1828	53	12' - 11"	1828	53	12' - 11"	1828			
Slab Longitudinal Top		8b3	53	9' - 0"	1274	53	9' - 0"	1274	53	9' - 0"	1274	53	9' - 0"	1274			
Slab Longitudinal Top		7b4	52	22' - 4"	2374	52	22' - 4"	2374	52	22' - 4"	2374	52	22' - 4"	2374			
Slab Longitudinal Top		8b5	52	11' - 7"	1609	52	11' - 7"	1609	52	11' - 7"	1609	52	11' - 7"	1609			
Slab Longitudinal Top		6b6	26	22' - 8"	886	26	22' - 8"	886	26	22' - 8"	886	26	22' - 8"	886			
Slab Longitudinal Top		6b7	53	21' - 9"	1732	53	21' - 9"	1732	53	21' - 9"	1732	53	21' - 9"	1732			
Slab Longitudinal Top, at Rail		8b8	8	39' - 11"	853	8	39' - 11"	853	8	39' - 11"	853	8	39' - 11"	853			
Slab Longitudinal Top, at Rail		8b9	8	29' - 0"	620	8	29' - 0"	620	8	29' - 0"	620	8	29' - 0"	620			
Slab Transverse Bottom		6c1	67	24' - 4"	2449	67	25' - 2"	2533	57	24' - 4"	2084	47	24' - 4"	1718			
Slab Transverse Bottom		6c2	67	21' - 3"	2139	67	22' - 0"	2214	59	21' - 3"	1884	51	21' - 3"	1628			
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447			
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	235	20	VARIES	386			
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298			
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311			
Slab Transverse Top		6d1	67	25' - 10"	2600	67	26' - 8"	2684	57	25' - 10"	2212	47	25' - 10"	1824			
Slab Transverse Top		6d2	67	21' - 11"	2206	67	22' - 8"	2282	59	21' - 11"	1943	51	21' - 11"	1679			
Slab Transverse Ends, Top		6d3	-	-	-	-	-	-	13	VARIES	271	20	VARIES	466			
Slab Transverse Ends, Top		6d4	-	-	-	-	-	-	11	VARIES	247	20	VARIES	411			
Slab Transverse Ends, Top		6d5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298			
Slab Transverse Ends, Top		6d6	-	-	-	-	-	-	11	VARIES	202	17	VARIES	328			
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691			
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418			
Slab, Hairpins, at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841			
Slab, Diagonal, at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818			
Top of Slab, Transverse, at Rail		7j1	132	8' - 3"	2226	132	8' - 3"	2226	132	8' - 3"	2226	130	8' - 3"	2193			
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185			
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334			
Epoxy Reinforcing Total Weight (lbs)					40,781			41,180			41,622			42,091			
Single-slope barrier rail - See Sheet J40-48-25.					3406			3406			3406			3406			
Open barrier rail - See Sheet J40-52-25.					4066			4066			4066			4066			
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap			Single Slope Rail	44,187			44,586			45,028			45,497			
				Open Rail	44,847			45,246			45,688			46,157			
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	44,187			44,586			45,028			45,497			
				Open Rail	44,847			45,246			45,688			46,157			
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	1655			1655			1655			1655			
				Open Rail	1572			1572			1572			1572			

Estimated Quantities for Superstructure 70' Bridge

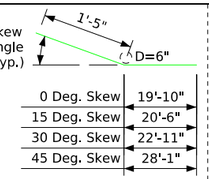
	Monolithic Cap				Non-Monolithic Cap			
Item	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	160.4	161.2	163.6	169.0	163.8	164.6	167.5	173.6
Reinf. Steel Epoxy Coated (lbs.)	44,163	44,562	45,004	45,477	44,163	44,562	45,004	45,477
Δ Reinf. Steel Stainless Steel (lbs.)	1888	1888	1888	1888	1888	1888	1888	1888
Concrete single-slope barrier or open rail (lin.ft.)	162.0	162.2	162.9	164.5	162.0	162.2	162.9	164.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	160.3	161.1	163.4	168.9	163.6	164.5	167.3	173.5
Reinf. Steel Epoxy Coated (lbs.)	44,823	45,222	45,664	46,137	44,823	45,222	45,664	46,137
Δ Reinf. Steel Stainless Steel (lbs.)	1795	1795	1795	1795	1795	1795	1795	1795

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

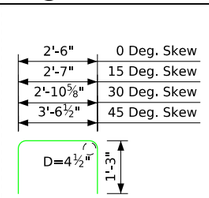
70'-0 Bridge-Bent Bar Details



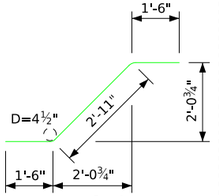
8e1



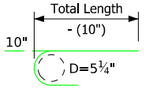
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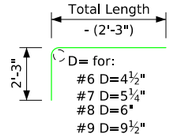
6e3



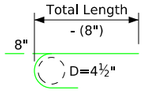
6e4



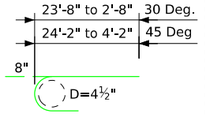
7j1



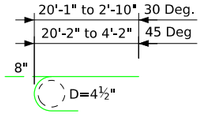
9b1, 7b4, 6b7, 8b8 and 8b9



6d1 and 6d2



6d3



6d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure

(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1"	223

8u1 bars are to be paid for under the price bid for **"Reinforcing Steel, Stainless Steel"**. Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

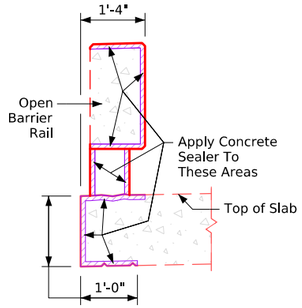
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
70'-0" Bridge Quantities

J40-03-25

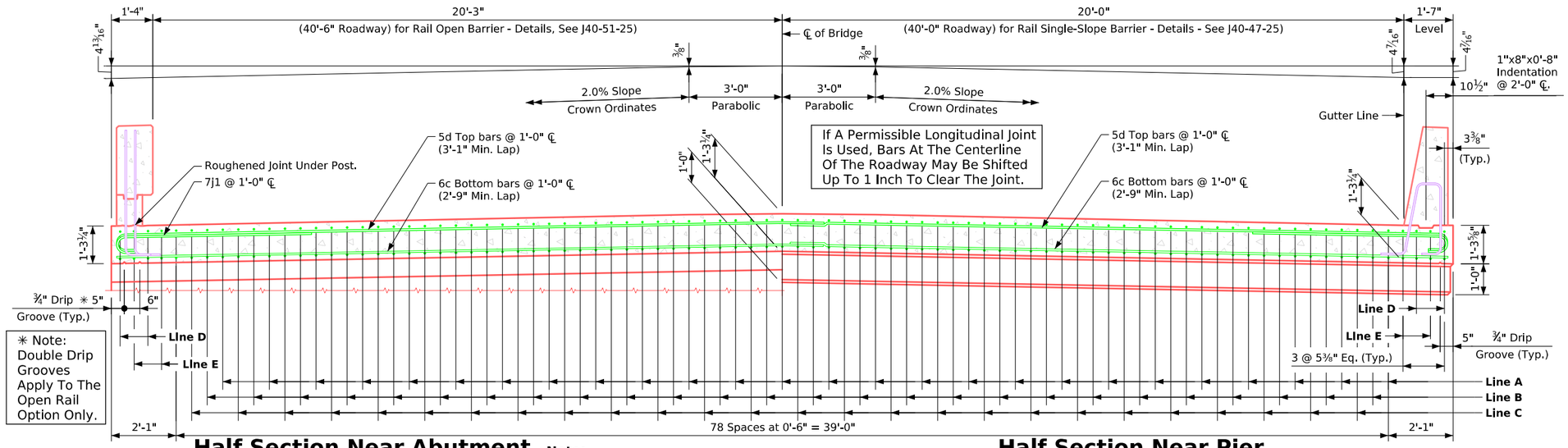
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 54.86 sq. ft.

Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 54.91 sq. ft.

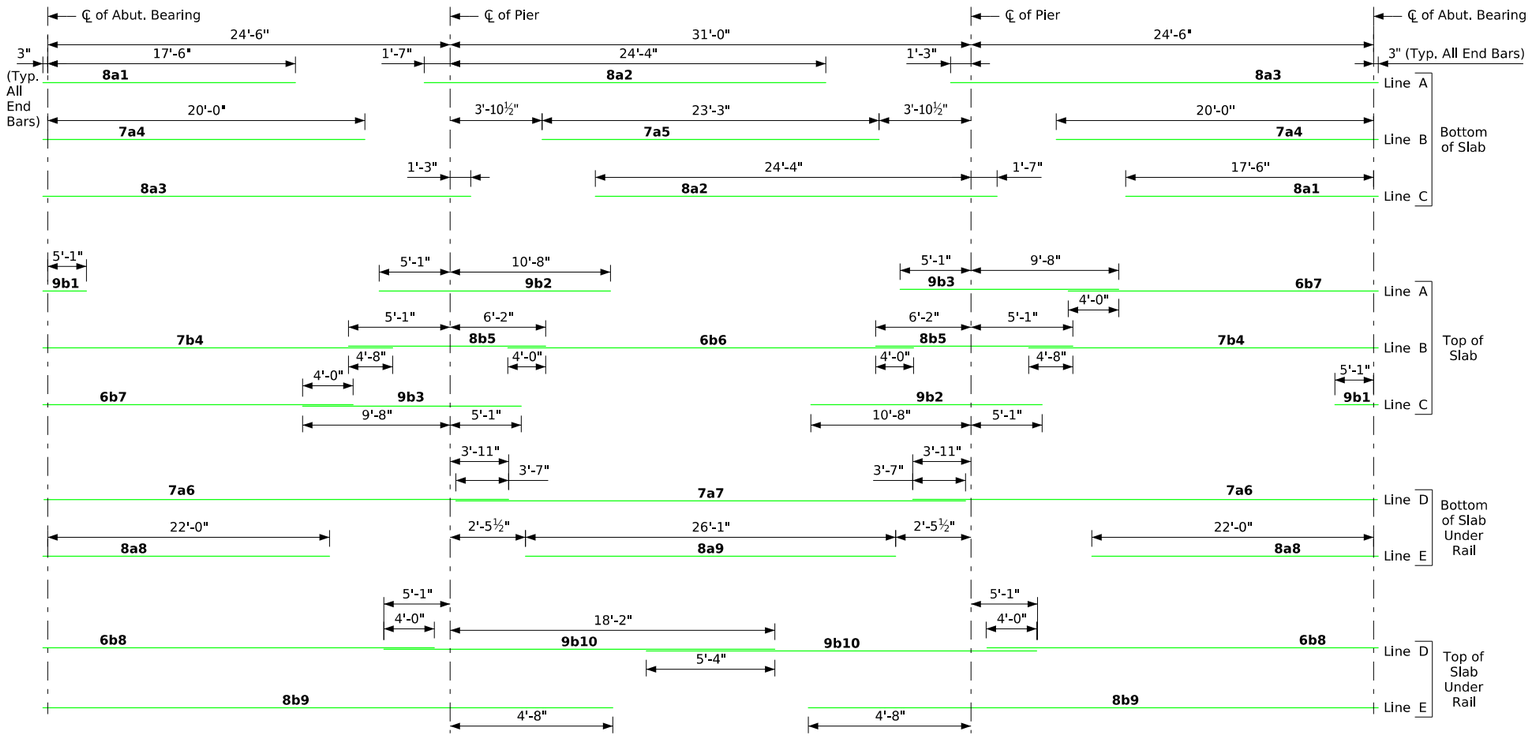
I.M. 451.01 Requirements Shall Apply For Bar Chairs.

Note:

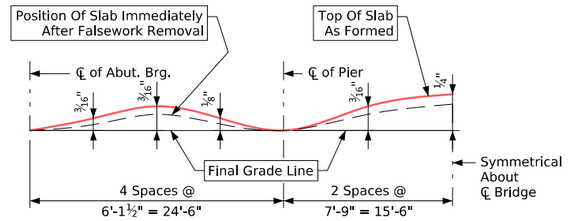
Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.



80' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
80'-0" Bridge

J40-04-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note.

Epoxy Steel Reinforcing for Superstructure-80' Bridge

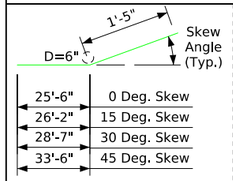
Location	Skew / Shape	0° Bar	0° No.	0° Length	0° Weight	15° No.	15° Length	15° Weight	30° No.	30° Length	30° Weight	45° No.	45° Length	45° Weight
Slab Longitudinal Bottom		8a1	53	17' - 9"	2512	53	17' - 9"	2512	53	17' - 9"	2512	53	17' - 9"	2512
Slab Longitudinal Bottom		8a2	53	25' - 11"	3668	53	25' - 11"	3668	53	25' - 11"	3668	53	25' - 11"	3668
Slab Longitudinal Bottom		8a3	53	26' - 0"	3680	53	26' - 0"	3680	53	26' - 0"	3680	53	26' - 0"	3680
Slab Longitudinal Bottom		7a4	52	20' - 3"	2153	52	20' - 3"	2153	52	20' - 3"	2153	52	20' - 3"	2153
Slab Longitudinal Bottom		7a5	26	23' - 3"	1236	26	23' - 3"	1236	26	23' - 3"	1236	26	23' - 3"	1236
Slab Longitudinal Bottom, at Rail		7a6	8	28' - 8"	469	8	28' - 8"	469	8	28' - 8"	469	8	28' - 8"	469
Slab Longitudinal Bottom, at Rail		7a7	4	30' - 4"	249	4	30' - 4"	249	4	30' - 4"	249	4	30' - 4"	249
Slab Longitudinal Bottom, at Rail		8a8	8	22' - 3"	476	8	22' - 3"	476	8	22' - 3"	476	8	22' - 3"	476
Slab Longitudinal Bottom, at Rail		8a9	4	26' - 1"	279	4	26' - 1"	279	4	26' - 1"	279	4	26' - 1"	279
Slab Longitudinal Top		9b1	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367
Slab Longitudinal Top		9b2	53	15' - 9"	2839	53	15' - 9"	2839	53	15' - 9"	2839	53	15' - 9"	2839
Slab Longitudinal Top		9b3	53	14' - 9"	2658	53	14' - 9"	2658	53	14' - 9"	2658	53	14' - 9"	2658
Slab Longitudinal Top		7b4	52	26' - 7"	2826	52	26' - 7"	2826	52	26' - 7"	2826	52	26' - 7"	2826
Slab Longitudinal Top		8b5	52	11' - 3"	1562	52	11' - 3"	1562	52	11' - 3"	1562	52	11' - 3"	1562
Slab Longitudinal Top		6b6	26	26' - 8"	1042	26	26' - 8"	1042	26	26' - 8"	1042	26	26' - 8"	1042
Slab Longitudinal Top		6b7	53	21' - 4"	1699	53	21' - 4"	1699	53	21' - 4"	1699	53	21' - 4"	1699
Slab Longitudinal Top, at Rail		6b8	8	25' - 11"	312	8	25' - 11"	312	8	25' - 11"	312	8	25' - 11"	312
Slab Longitudinal Top, at Rail		8b9	8	31' - 8"	677	8	31' - 8"	677	8	31' - 8"	677	8	31' - 8"	677
Slab Longitudinal Top, at Rail		9b10	8	23' - 3"	633	8	23' - 3"	633	8	23' - 3"	633	8	23' - 3"	633
Slab Transverse Bottom		6c1	77	24' - 4"	2815	77	25' - 2"	2911	67	24' - 4"	2449	57	24' - 4"	2084
Slab Transverse Bottom		6c2	77	21' - 3"	2458	77	22' - 0"	2545	69	21' - 3"	2203	61	21' - 3"	1947
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311
Slab Transverse Top		5d1	77	25' - 3"	2028	77	26' - 1"	2095	67	25' - 3"	1765	57	25' - 3"	1502
Slab Transverse Top		5d2	77	21' - 10"	1754	77	22' - 7"	1814	69	21' - 10"	1572	61	21' - 10"	1390
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227
Slab, Transverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818
Top of Slab, Transverse, at Rail		7j1	152	8' - 3"	2564	152	8' - 3"	2564	142	8' - 3"	2395	136	8' - 3"	2294
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334
Epoxy Reinforcing Total Weight (lbs)					46,300			46,690			46,895			47,316
Single-slope barrier rail - See Sheet J40-48-25.					3798			3798			3798			3798
Open barrier rail - See Sheet J40-52-25.					4427			4427			4427			4427
Epoxy Coated Rail Total - lbs. Monolithic Pier Cap	Single Slope Rail				50,098			50,488			50,693			51,114
	Open Rail				50,727			51,117			51,322			51,743
Epoxy Coated Rail Total - lbs. Non-Monolithic Pier Cap	Single Slope Rail				50,098			50,488			50,693			51,114
	Open Rail				50,727			51,117			51,322			51,743
Stainless Steel Rail Total - lbs. Non-Monolithic Pier Cap	Single Slope Rail				1826			1826			1826			1826
	Open Rail				1717			1717			1717			1717

Estimated Quantities for Superstructure 80' Bridge

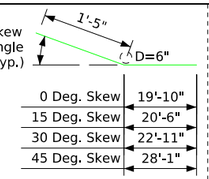
Item	Monolithic Cap 0°	15°	30°	45°	Non-Monolithic Cap 0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	187.4	188.3	190.5	195.9	190.8	191.6	196.1	200.5
Reinf. Steel Epoxy Coated (lbs.)	50,074	50,464	50,669	51,094	50,074	50,464	50,669	51,094
Δ Reinf. Steel Stainless Steel (lbs.)	2049	2049	2049	2049	2049	2049	2049	2049
Concrete single-slope barrier or open rail (lin.ft.)	182	182.2	182.9	184.5	182	182.2	182.9	184.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	187.3	188.1	190.4	195.8	190.6	191.5	194.3	200.4
Reinf. Steel Epoxy Coated (lbs.)	50,703	51,093	51,298	51,723	50,703	51,093	51,298	51,723
Δ Reinf. Steel Stainless Steel (lbs.)	1940	1940	1940	1940	1940	1940	1940	1940

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

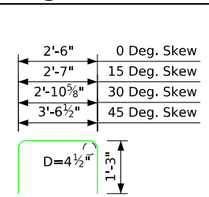
80'-0 Bridge-Bent Bar Details



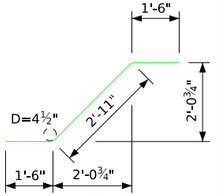
8e1



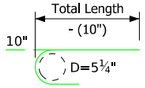
8e2



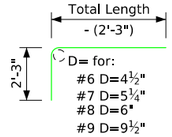
6e3



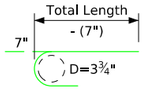
6e4



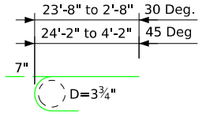
7j1



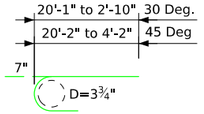
9b1, 7b4, 6b7, 6b8 and 8b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure

(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for **"Reinforcing Steel, Stainless Steel"**. Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

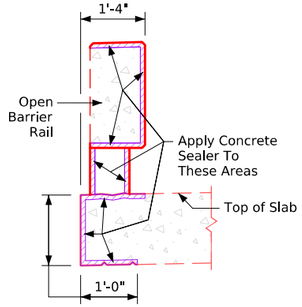
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
80'-0" Bridge Quantities

J40-05-25

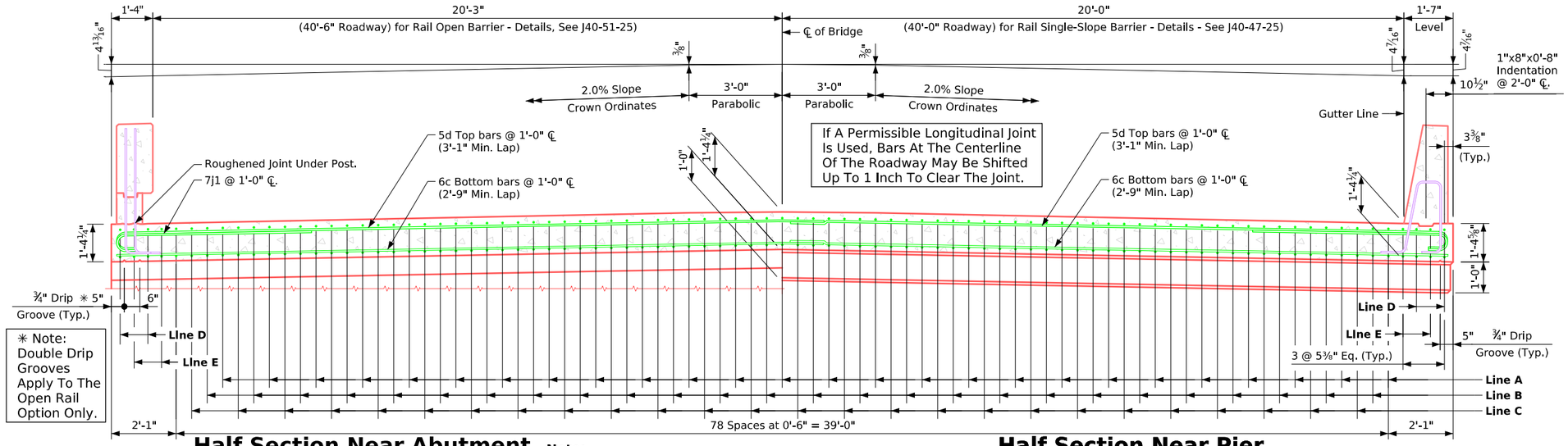
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 58.45 sq. ft.

Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 58.50 sq. ft.

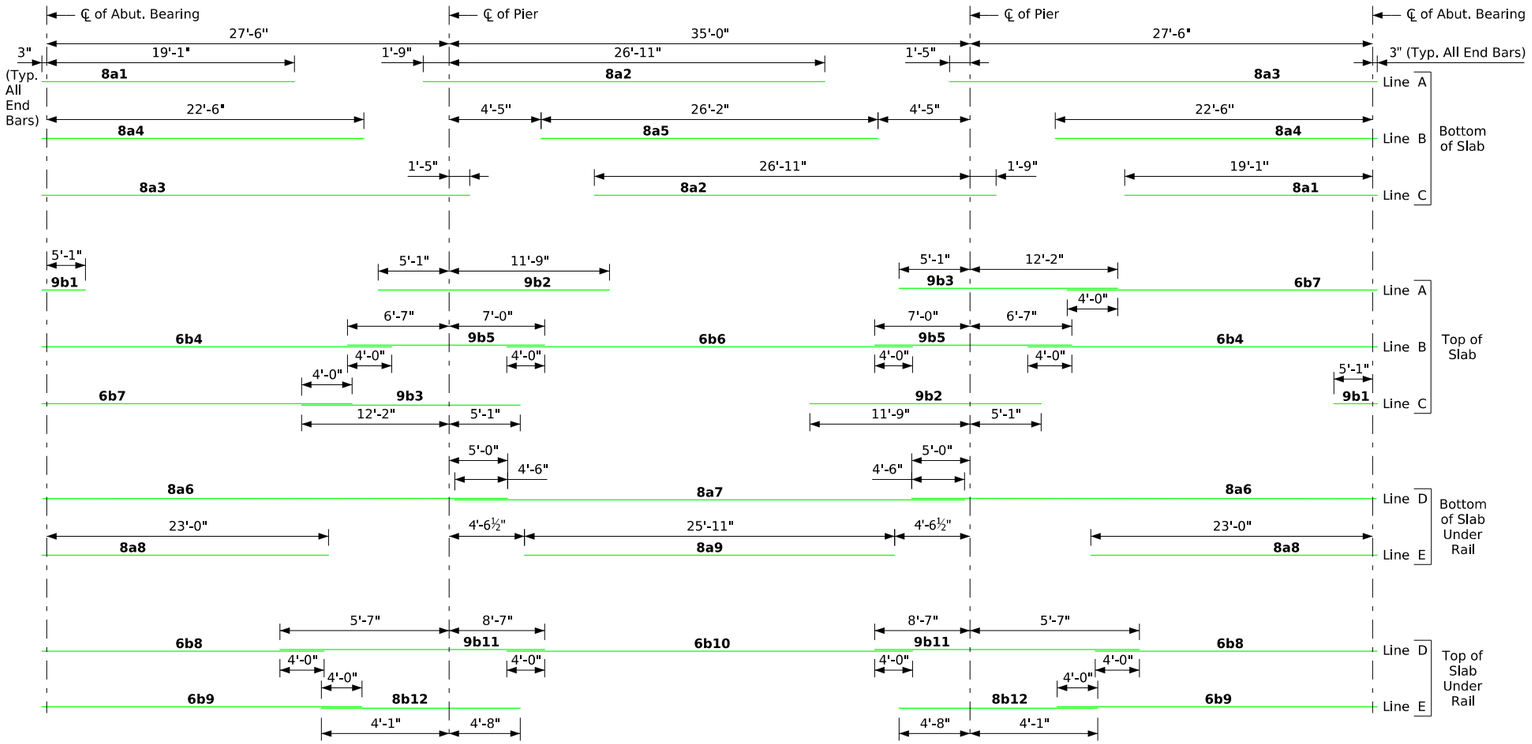
I.M. 451.01 Requirements Shall Apply For Bar Chairs.

Note:

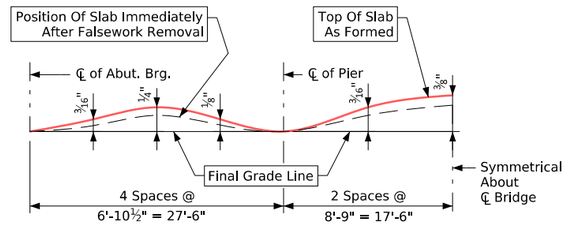
Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.



90' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
90'-0" Bridge

J40-06-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note.

Epoxy Steel Reinforcing for Superstructure-90' Bridge

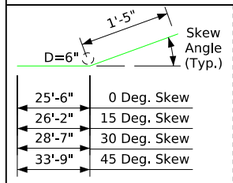
Location	Skew	0°				15°			30°			45°		
	Shape	Bar	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
Slab Longitudinal Bottom		8a1	53	19' - 4"	2736	53	19' - 4"	2736	53	19' - 4"	2736	53	19' - 4"	2736
Slab Longitudinal Bottom		8a2	53	28' - 8"	4057	53	28' - 8"	4057	53	28' - 8"	4057	53	28' - 8"	4057
Slab Longitudinal Bottom		8a3	53	29' - 2"	4128	53	29' - 2"	4128	53	29' - 2"	4128	53	29' - 2"	4128
Slab Longitudinal Bottom		8a4	52	22' - 9"	3159	52	22' - 9"	3159	52	22' - 9"	3159	52	22' - 9"	3159
Slab Longitudinal Bottom		8a5	26	26' - 2"	1817	26	26' - 2"	1817	26	26' - 2"	1817	26	26' - 2"	1817
Slab Longitudinal Bottom, at Rail		8a6	8	32' - 9"	700	8	32' - 9"	700	8	32' - 9"	700	8	32' - 9"	700
Slab Longitudinal Bottom, at Rail		8a7	4	34' - 0"	364	4	34' - 0"	364	4	34' - 0"	364	4	34' - 0"	364
Slab Longitudinal Bottom, at Rail		8a8	8	23' - 3"	497	8	23' - 3"	497	8	23' - 3"	497	8	23' - 3"	497
Slab Longitudinal Bottom, at Rail		8a9	4	25' - 11"	277	4	25' - 11"	277	4	25' - 11"	277	4	25' - 11"	277
Slab Longitudinal Top		9b1	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367
Slab Longitudinal Top		9b2	53	16' - 10"	3034	53	16' - 10"	3034	53	16' - 10"	3034	53	16' - 10"	3034
Slab Longitudinal Top		9b3	53	17' - 3"	3109	53	17' - 3"	3109	53	17' - 3"	3109	53	17' - 3"	3109
Slab Longitudinal Top		6b4	52	27' - 5"	2142	52	27' - 5"	2142	52	27' - 5"	2142	52	27' - 5"	2142
Slab Longitudinal Top		9b5	52	13' - 7"	2402	52	13' - 7"	2402	52	13' - 7"	2402	52	13' - 7"	2402
Slab Longitudinal Top		6b6	26	29' - 0"	1133	26	29' - 0"	1133	26	29' - 0"	1133	26	29' - 0"	1133
Slab Longitudinal Top		6b7	53	21' - 10"	1739	53	21' - 10"	1739	53	21' - 10"	1739	53	21' - 10"	1739
Slab Longitudinal Top, at Rail		6b8	8	28' - 5"	342	8	28' - 5"	342	8	28' - 5"	342	8	28' - 5"	342
Slab Longitudinal Top, at Rail		6b9	8	29' - 11"	360	8	29' - 11"	360	8	29' - 11"	360	8	29' - 11"	360
Slab Longitudinal Top, at Rail		6b10	4	25' - 10"	156	4	25' - 10"	156	4	25' - 10"	156	4	25' - 10"	156
Slab Longitudinal Top, at Rail		9b11	8	14' - 2"	386	8	14' - 2"	386	8	14' - 2"	386	8	14' - 2"	386
Slab Longitudinal Top, at Rail		8b12	8	8' - 9"	187	8	8' - 9"	187	8	8' - 9"	187	8	8' - 9"	187
Slab Transverse Bottom		6c1	87	24' - 4"	3180	87	25' - 2"	3289	77	24' - 4"	2815	67	24' - 4"	2449
Slab Transverse Bottom		6c2	87	21' - 3"	2777	87	22' - 0"	2875	79	21' - 3"	2522	71	21' - 3"	2267
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311
Slab Transverse Top		5d1	87	25' - 3"	2292	87	26' - 1"	2367	77	25' - 3"	2028	67	25' - 3"	1765
Slab Transverse Top		5d2	87	21' - 10"	1982	87	22' - 7"	2050	79	21' - 10"	1800	71	21' - 10"	1617
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818
Top of Slab, Transverse, at Rail		7j1	172	8' - 3"	2901	172	8' - 3"	2901	162	8' - 3"	2732	156	8' - 3"	2631
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334
Epoxy Reinforcing Total Weight (lbs)					51,568			51,998			52,163			52,583
Single-slope barrier rail - See Sheet J40-48-25.					4134			4134			4134			4134
Open barrier rail - See Sheet J40-52-25.					4789			4789			4789			4789
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap	Single Slope Rail			55,702			56,132			56,297			56,717
		Open Rail			56,357			56,787			56,952			57,372
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap	Single Slope Rail			55,702			56,132			56,297			56,717
		Open Rail			56,357			56,787			56,952			57,372
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap	Single Slope Rail			2020			2020			2020			2020
		Open Rail			1867			1867			1867			1867

Estimated Quantities for Superstructure 90' Bridge

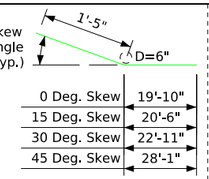
Item	Monolithic Cap				Non-Monolithic Cap			
	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	219.4	220.2	222.4	227.7	222.7	223.5	226.3	232.3
Reinf. Steel Epoxy Coated (lbs.)	55,678	56,108	56,273	56,697	55,678	56,108	56,273	56,697
Δ Reinf. Steel Stainless Steel (lbs.)	2243	2243	2243	2243	2243	2243	2243	2243
Concrete single-slope barrier or open rail (lin.ft.)	202	202.2	202.9	204.5	202	202.2	202.9	204.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	219.3	220.1	222.3	227.6	222.5	223.4	226.1	232.1
Reinf. Steel Epoxy Coated (lbs.)	56,333	56,763	56,928	57,352	56,333	56,763	56,928	57,352
Δ Reinf. Steel Stainless Steel (lbs.)	2090	2090	2090	2090	2090	2090	2090	2090

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

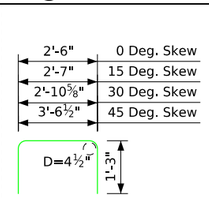
90'-0 Bridge-Bent Bar Details



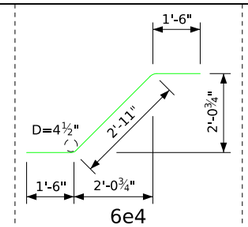
8e1



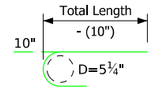
8e2



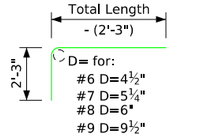
6e3



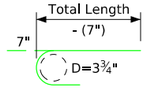
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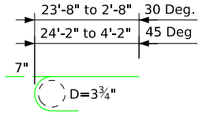
7j1



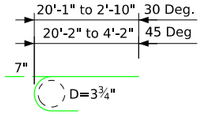
9b1, 6b4, 6b7, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure

(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for "**Reinforcing Steel, Stainless Steel**". Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

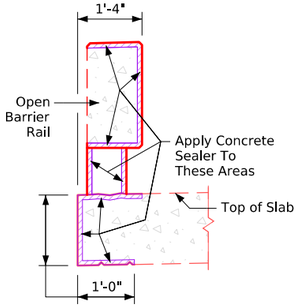
July, 2025

Superstructure Details
90'-0" Bridge Quantities

J40-07-25

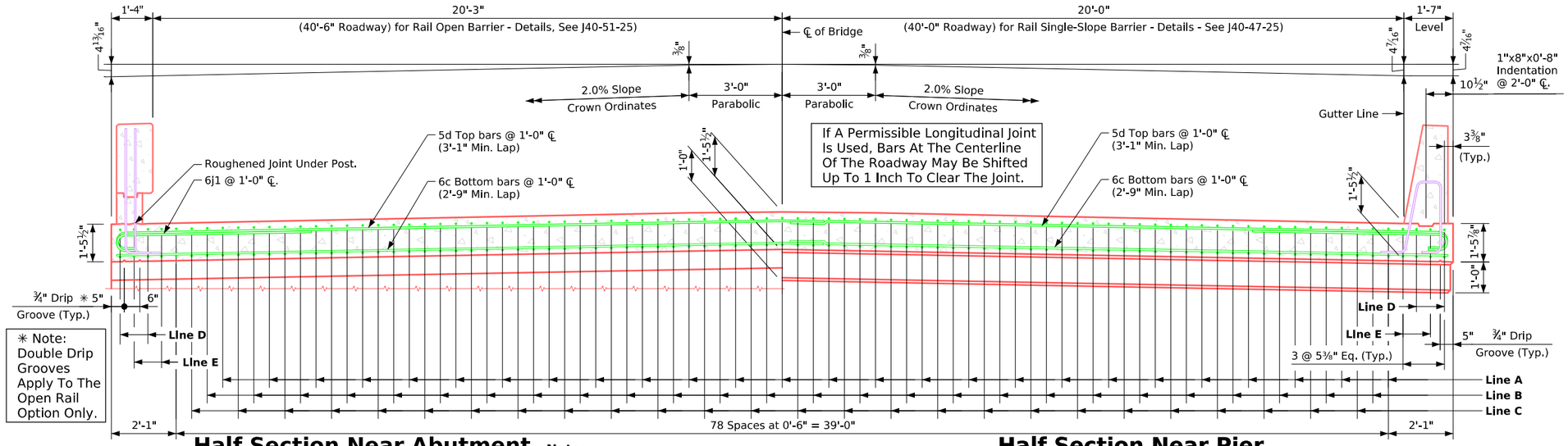
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.

Revised 09-2026: Updated Bridge Engineer signature. Changed 10b3 bar dimensions to 6'-3" and 11'-9" (was 6'-0" and 12'-0") in "Placement for Longitudinal Reinforcement" detail. Updated "Concrete Sealer" note.



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts. The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 62.95 sq. ft.

Note:

Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

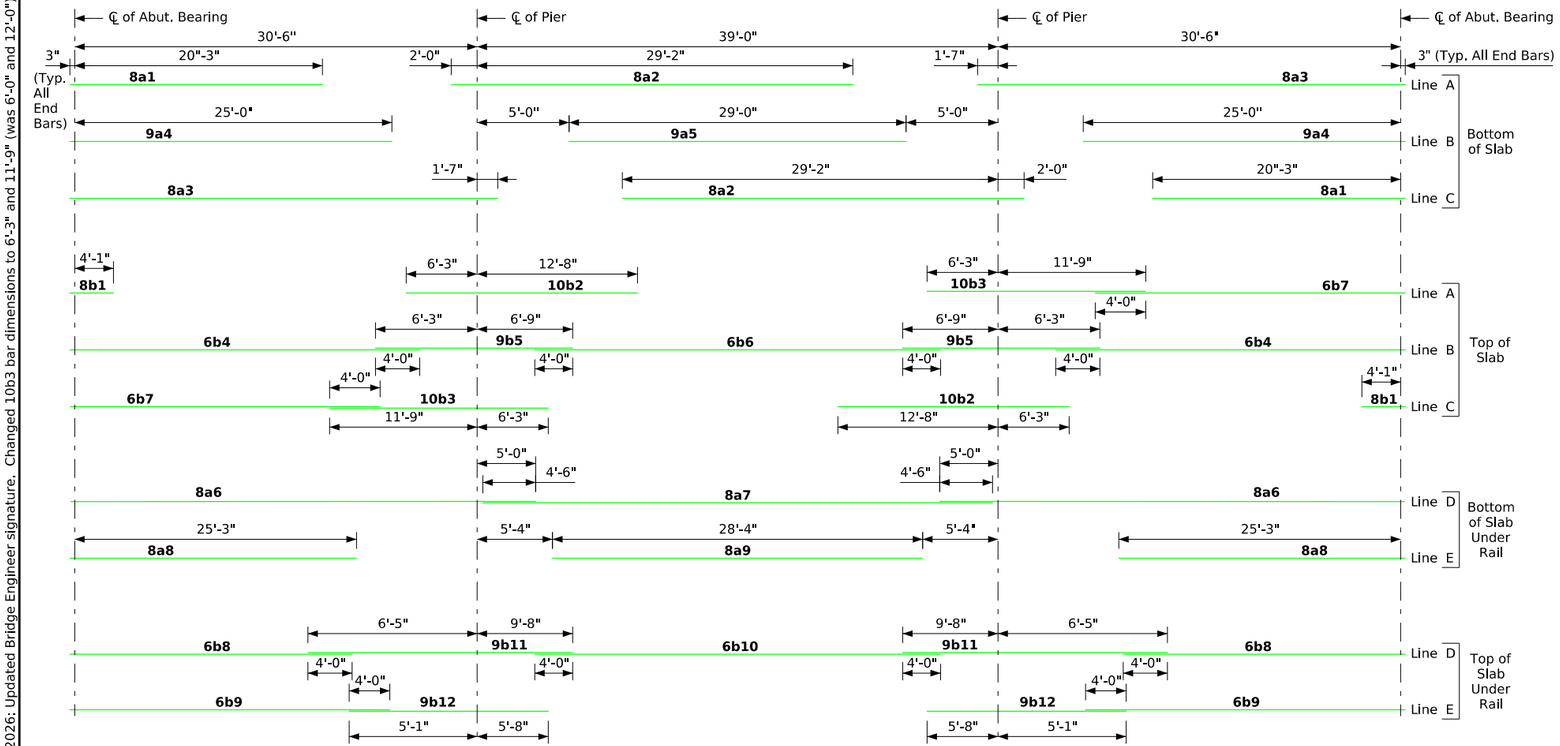
Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.

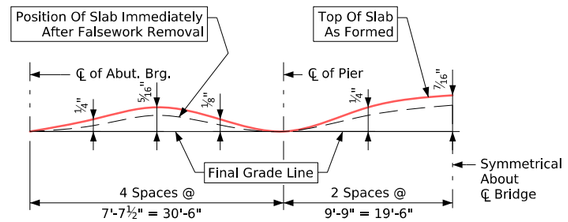
Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 63.00 sq. ft.

I.M. 451.01 Requirements Shall Apply For Bar Chairs.



100' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
100'-0" Bridge

J40-08-25

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Epoxy Steel Reinforcing for Superstructure-100' Bridge

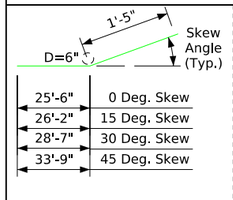
	Skew	0°				15°			30°			45°		
Location	Shape	Bar	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
Slab Longitudinal Bottom		8a1	53	20' - 6"	2901	53	20' - 6"	2901	53	20' - 6"	2901	53	20' - 6"	2901
Slab Longitudinal Bottom		8a2	53	31' - 2"	4411	53	31' - 2"	4411	53	31' - 2"	4411	53	31' - 2"	4411
Slab Longitudinal Bottom		8a3	53	32' - 4"	4576	53	32' - 4"	4576	53	32' - 4"	4576	53	32' - 4"	4576
Slab Longitudinal Bottom		9a4	52	25' - 3"	4465	52	25' - 3"	4465	52	25' - 3"	4465	52	25' - 3"	4465
Slab Longitudinal Bottom		9a5	26	29' - 0"	2564	26	29' - 0"	2564	26	29' - 0"	2564	26	29' - 0"	2564
Slab Longitudinal Bottom, at Rail		8a6	8	35' - 9"	764	8	35' - 9"	764	8	35' - 9"	764	8	35' - 9"	764
Slab Longitudinal Bottom, at Rail		8a7	4	38' - 0"	406	4	38' - 0"	406	4	38' - 0"	406	4	38' - 0"	406
Slab Longitudinal Bottom, at Rail		8a8	8	25' - 6"	545	8	25' - 6"	545	8	25' - 6"	545	8	25' - 6"	545
Slab Longitudinal Bottom, at Rail		8a9	4	28' - 4"	303	4	28' - 4"	303	4	28' - 4"	303	4	28' - 4"	303
Slab Longitudinal Top		8b1	53	6' - 7"	932	53	6' - 7"	932	53	6' - 7"	932	53	6' - 7"	932
Slab Longitudinal Top		10b2	53	18' - 11"	4315	53	18' - 11"	4315	53	18' - 11"	4315	53	18' - 11"	4315
Slab Longitudinal Top		10b3	53	18' - 0"	4106	53	18' - 0"	4106	53	18' - 0"	4106	53	18' - 0"	4106
Slab Longitudinal Top		6b4	52	30' - 9"	2402	52	30' - 9"	2402	52	30' - 9"	2402	52	30' - 9"	2402
Slab Longitudinal Top		9b5	52	13' - 0"	2299	52	13' - 0"	2299	52	13' - 0"	2299	52	13' - 0"	2299
Slab Longitudinal Top		6b6	26	33' - 6"	1309	26	33' - 6"	1309	26	33' - 6"	1309	26	33' - 6"	1309
Slab Longitudinal Top		6b7	53	25' - 3"	2011	53	25' - 3"	2011	53	25' - 3"	2011	53	25' - 3"	2011
Slab Longitudinal Top, at Rail		6b8	8	30' - 7"	368	8	30' - 7"	368	8	30' - 7"	368	8	30' - 7"	368
Slab Longitudinal Top, at Rail		6b9	8	31' - 11"	384	8	31' - 11"	384	8	31' - 11"	384	8	31' - 11"	384
Slab Longitudinal Top, at Rail		6b10	4	27' - 8"	167	4	27' - 8"	167	4	27' - 8"	167	4	27' - 8"	167
Slab Longitudinal Top, at Rail		9b11	8	16' - 1"	438	8	16' - 1"	438	8	16' - 1"	438	8	16' - 1"	438
Slab Longitudinal Top, at Rail		9b12	8	10' - 9"	293	8	10' - 9"	293	8	10' - 9"	293	8	10' - 9"	293
Slab Transverse Bottom		6c1	97	24' - 4"	3546	97	25' - 2"	3667	87	24' - 4"	3180	77	24' - 4"	2815
Slab Transverse Bottom		6c2	97	21' - 3"	3096	97	22' - 0"	3206	89	21' - 3"	2841	81	21' - 3"	2586
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311
Slab Transverse Top		5d1	97	25' - 3"	2555	97	26' - 1"	2639	87	25' - 3"	2292	77	25' - 3"	2028
Slab Transverse Top		5d2	97	21' - 10"	2209	97	22' - 7"	2285	89	21' - 10"	2027	81	21' - 10"	1845
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818
Top of Slab, Transverse, at Rail		6j1	192	7' - 7"	2187	192	7' - 7"	2187	182	7' - 7"	2074	176	7' - 7"	2005
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334
Epoxy Reinforcing Total Weight (lbs)					57,896			58,367			58,547			59,000
Single-slope barrier rail - See Sheet J40-48-25.					4461			4461			4461			4461
Open barrier rail - See Sheet J40-52-25.					5151			5151			5151			5151
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap			Single Slope Rail	62,357			62,828			63,008			63,461
				Open Rail	63,047			63,518			63,698			64,151
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	62,357			62,828			63,008			63,461
				Open Rail	63,047			63,518			63,698			64,151
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	2221			2221			2221			2221
				Open Rail	2020			2020			2020			2020

Estimated Quantities for Superstructure 100' Bridge

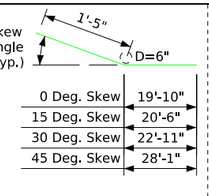
	Monolithic Cap				Non-Monolithic Cap			
Item	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	257.2	258	260.2	265.3	260.5	261.3	264	269.9
Reinf. Steel Epoxy Coated (lbs.)	62,333	62,804	62,984	63,441	62,333	62,804	62,984	63,441
Δ Reinf. Steel Stainless Steel (lbs.)	2444	2444	2444	2444	2444	2444	2444	2444
Concrete single-slope barrier or open rail (lin.ft.)	222	222.2	222.9	224.5	222	222.2	222.9	224.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	257	257.8	260	265.1	260.4	261.2	263.9	269.7
Reinf. Steel Epoxy Coated (lbs.)	63,023	63,494	63,674	64,131	63,023	63,494	63,674	64,131
Δ Reinf. Steel Stainless Steel (lbs.)	2243	2243	2243	2243	2243	2243	2243	2243

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

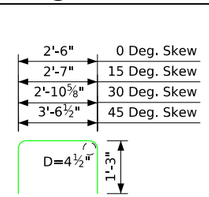
100'-0 Bridge-Bent Bar Details



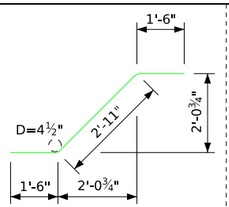
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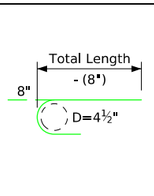
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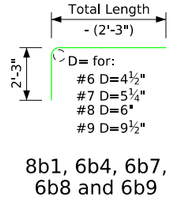
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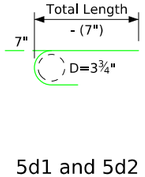
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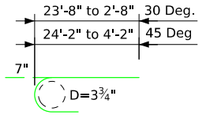
6j1



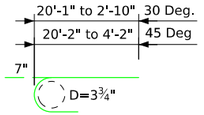
8b1, 6b4, 6b7, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure
(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for "**Reinforcing Steel, Stainless Steel**". Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

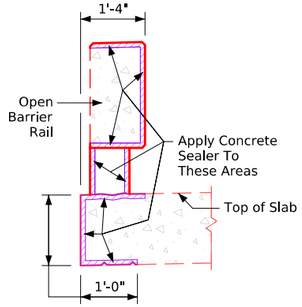
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
100'-0" Bridge Quantities

J40-09-25

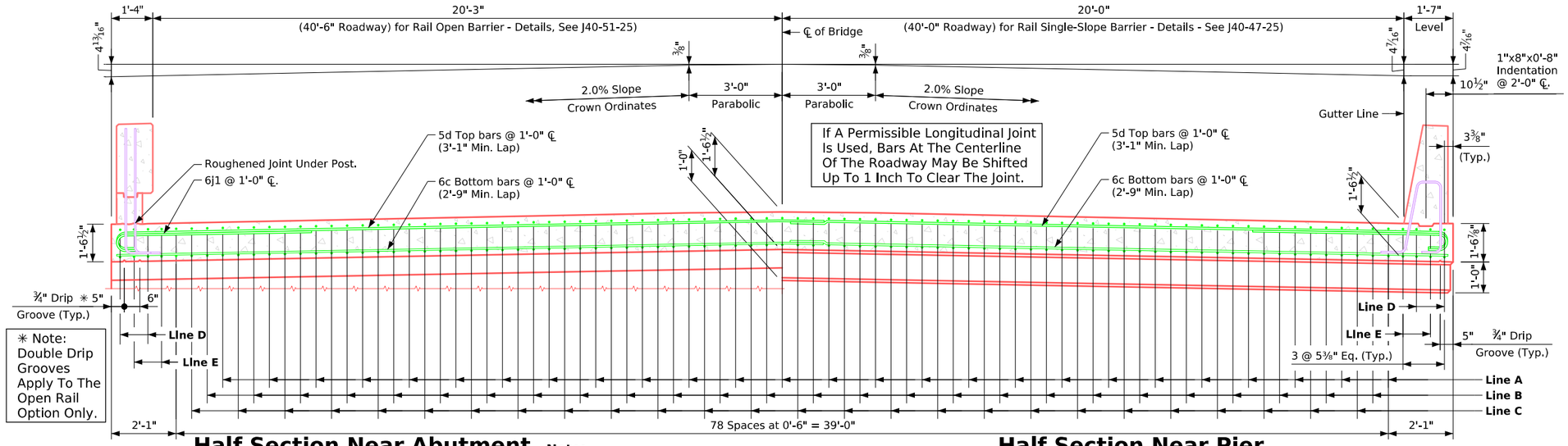
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 66.55 sq. ft.

Note:

Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

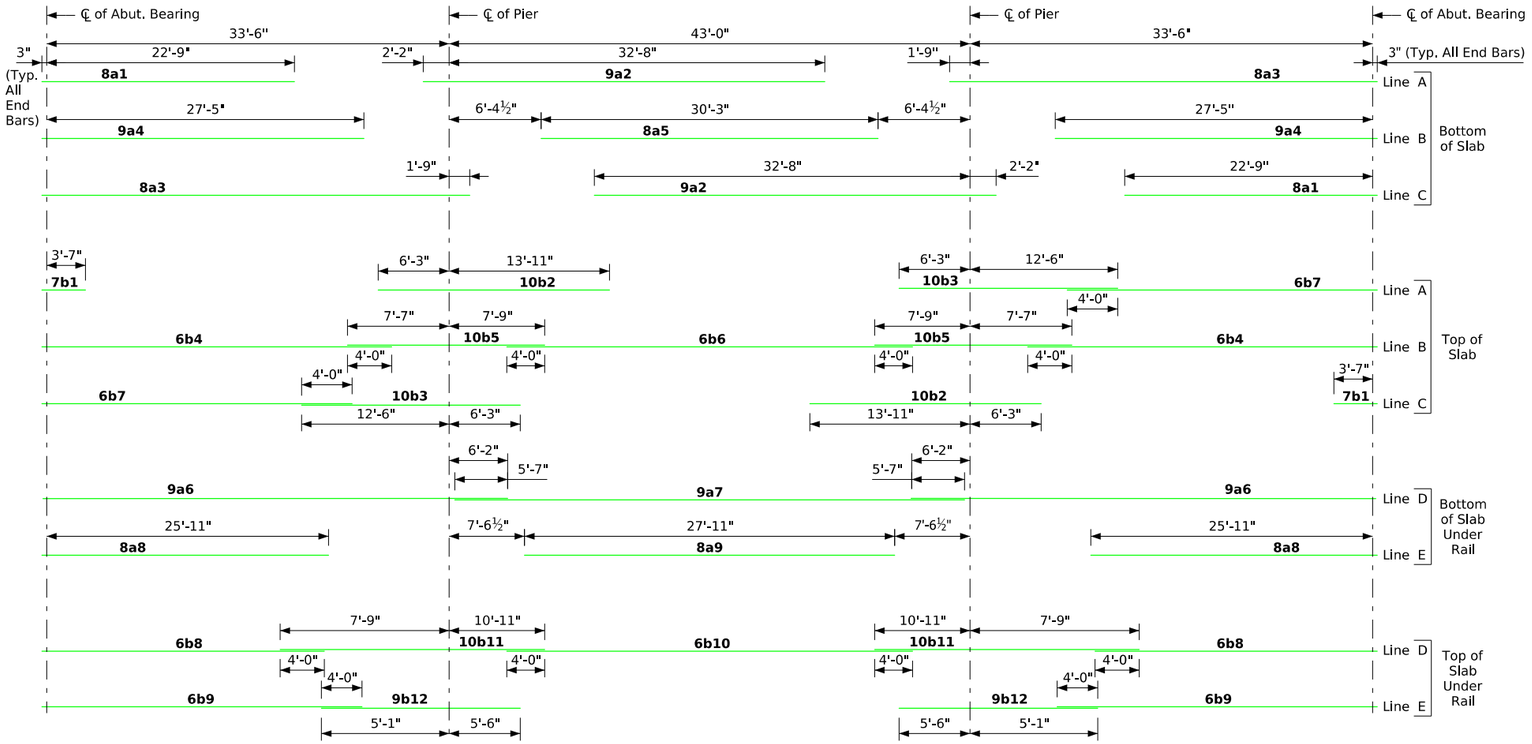
Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.

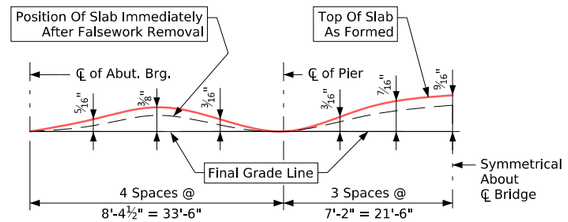
Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 66.60 sq. ft.

I.M. 451.01 Requirements Shall Apply For Bar Chairs.



110' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details 110'-0" Bridge

J40-10-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note.

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Epoxy Steel Reinforcing for Superstructure-110' Bridge

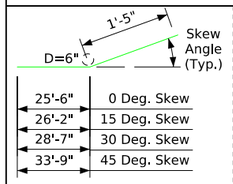
	Skew	0°				15°				30°				45°			
Location	Shape	Bar	No.	Length	Weight	No.	Length	Weight		No.	Length	Weight		No.	Length	Weight	
Slab Longitudinal Bottom		8a1	53	23' - 0"	3255	53	23' - 0"	3255		53	23' - 0"	3255		53	23' - 0"	3255	
Slab Longitudinal Bottom		9a2	53	34' - 10"	6277	53	34' - 10"	6277		53	34' - 10"	6277		53	34' - 10"	6277	
Slab Longitudinal Bottom		8a3	53	35' - 6"	5024	53	35' - 6"	5024		53	35' - 6"	5024		53	35' - 6"	5024	
Slab Longitudinal Bottom		9a4	52	27' - 8"	4892	52	27' - 8"	4892		52	27' - 8"	4892		52	27' - 8"	4892	
Slab Longitudinal Bottom		8a5	26	30' - 3"	2100	26	30' - 3"	2100		26	30' - 3"	2100		26	30' - 3"	2100	
Slab Longitudinal Bottom, at Rail		9a6	8	39' - 11"	1086	8	39' - 11"	1086		8	39' - 11"	1086		8	39' - 11"	1086	
Slab Longitudinal Bottom, at Rail		9a7	4	41' - 10"	569	4	41' - 10"	569		4	41' - 10"	569		4	41' - 10"	569	
Slab Longitudinal Bottom, at Rail		8a8	8	26' - 3"	561	8	26' - 3"	561		8	26' - 3"	561		8	26' - 3"	561	
Slab Longitudinal Bottom, at Rail		8a9	4	27' - 11"	299	4	27' - 11"	299		4	27' - 11"	299		4	27' - 11"	299	
Slab Longitudinal Top		7b1	53	6' - 1"	660	53	6' - 1"	660		53	6' - 1"	660		53	6' - 1"	660	
Slab Longitudinal Top		10b2	53	20' - 2"	4600	53	20' - 2"	4600		53	20' - 2"	4600		53	20' - 2"	4600	
Slab Longitudinal Top		10b3	53	18' - 9"	4277	53	18' - 9"	4277		53	18' - 9"	4277		53	18' - 9"	4277	
Slab Longitudinal Top		6b4	52	32' - 5"	2532	52	32' - 5"	2532		52	32' - 5"	2532		52	32' - 5"	2532	
Slab Longitudinal Top		10b5	52	15' - 4"	3431	52	15' - 4"	3431		52	15' - 4"	3431		52	15' - 4"	3431	
Slab Longitudinal Top		6b6	26	35' - 6"	1387	26	35' - 6"	1387		26	35' - 6"	1387		26	35' - 6"	1387	
Slab Longitudinal Top		6b7	53	27' - 6"	2190	53	27' - 6"	2190		53	27' - 6"	2190		53	27' - 6"	2190	
Slab Longitudinal Top, at Rail		6b8	8	32' - 3"	388	8	32' - 3"	388		8	32' - 3"	388		8	32' - 3"	388	
Slab Longitudinal Top, at Rail		6b9	8	34' - 11"	420	8	34' - 11"	420		8	34' - 11"	420		8	34' - 11"	420	
Slab Longitudinal Top, at Rail		6b10	4	29' - 2"	176	4	29' - 2"	176		4	29' - 2"	176		4	29' - 2"	176	
Slab Longitudinal Top, at Rail		10b11	8	18' - 8"	643	8	18' - 8"	643		8	18' - 8"	643		8	18' - 8"	643	
Slab Longitudinal Top, at Rail		9b12	8	10' - 7"	288	8	10' - 7"	288		8	10' - 7"	288		8	10' - 7"	288	
Slab Transverse Bottom		6c1	107	24' - 4"	3911	107	25' - 2"	4045		97	24' - 4"	3546		87	24' - 4"	3180	
Slab Transverse Bottom		6c2	107	21' - 3"	3416	107	22' - 0"	3536		99	21' - 3"	3160		91	21' - 3"	2905	
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-		13	VARIES	262		21	VARIES	447	
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-		11	VARIES	233		20	VARIES	386	
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-		10	VARIES	173		17	VARIES	298	
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-		11	VARIES	191		17	VARIES	311	
Slab Transverse Top		5d1	107	25' - 3"	2818	107	26' - 1"	2911		97	25' - 3"	2555		87	25' - 3"	2292	
Slab Transverse Top		5d2	107	21' - 10"	2437	107	22' - 7"	2521		99	21' - 10"	2255		91	21' - 10"	2073	
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-		13	VARIES	188		21	VARIES	324	
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-		11	VARIES	166		20	VARIES	275	
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-		10	VARIES	120		17	VARIES	207	
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-		11	VARIES	139		17	VARIES	227	
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326		18	30' - 0"	1442		18	35' - 2"	1691	
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058		18	24' - 4"	1174		18	29' - 6"	1418	
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703		92	5' - 5"	749		92	6' - 1"	841	
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818		92	5' - 11"	818		92	5' - 11"	818	
Top of Slab, Transverse, at Rail		6j1	212	7' - 7"	2415	212	7' - 7"	2415		202	7' - 7"	2301		196	7' - 7"	2233	
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185		40	4' - 5"	185		40	4' - 5"	185	
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334		48	6' - 8"	334		48	6' - 8"	334	
Epoxy Reinforcing Total Weight (lbs)					64,396			64,907				65,046				65,500	
Single-slope barrier rail - See Sheet J40-48-25.					4787			4787				4787				4787	
Open barrier rail - See Sheet J40-52-25.					5607			5607				5607				5607	
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap			Single Slope Rail	69,183			69,694				69,833				70,287	
				Open Rail	70,003			70,514				70,653				71,107	
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	69,183			69,694				69,833				70,287	
				Open Rail	70,003			70,514				70,653				71,107	
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	2416			2416				2416				2416	
				Open Rail	2178			2178				2178				2178	

Estimated Quantities for Superstructure 110' Bridge

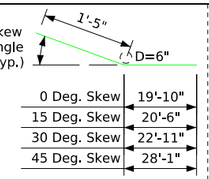
	Monolithic Cap				Non-Monolithic Cap			
Item	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	294.8	295.6	297.6	302.7	298.1	298.9	301.6	307.3
Reinf. Steel Epoxy Coated (lbs.)	69,159	69,670	69,809	70,267	69,159	69,670	69,809	70,267
Δ Reinf. Steel Stainless Steel (lbs.)	2639	2639	2639	2639	2639	2639	2639	2639
Concrete single-slope barrier or open rail (lin.ft.)	242	242.2	242.9	244.5	242	242.2	242.9	244.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	294.6	295.3	297.5	302.5	297.9	298.7	301.4	307.1
Reinf. Steel Epoxy Coated (lbs.)	69,979	70,490	70,629	71,087	69,979	70,490	70,629	71,087
Δ Reinf. Steel Stainless Steel (lbs.)	2401	2401	2401	2401	2401	2401	2401	2401

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

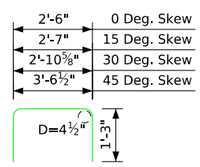
110'-0 Bridge-Bent Bar Details



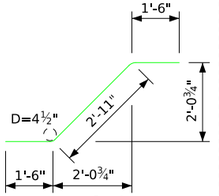
8e1



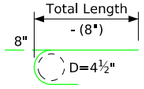
8e2



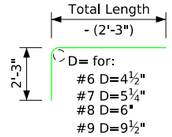
6e3



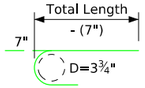
6e4



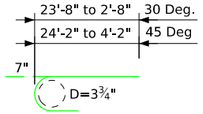
6j1



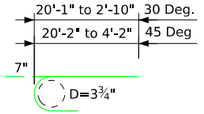
7b1, 6b4, 6b7, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure
(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for "**Reinforcing Steel, Stainless Steel**". Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

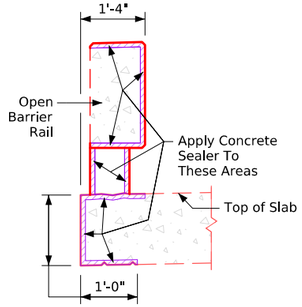
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
110'-0" Bridge Quantities

J40-11-25

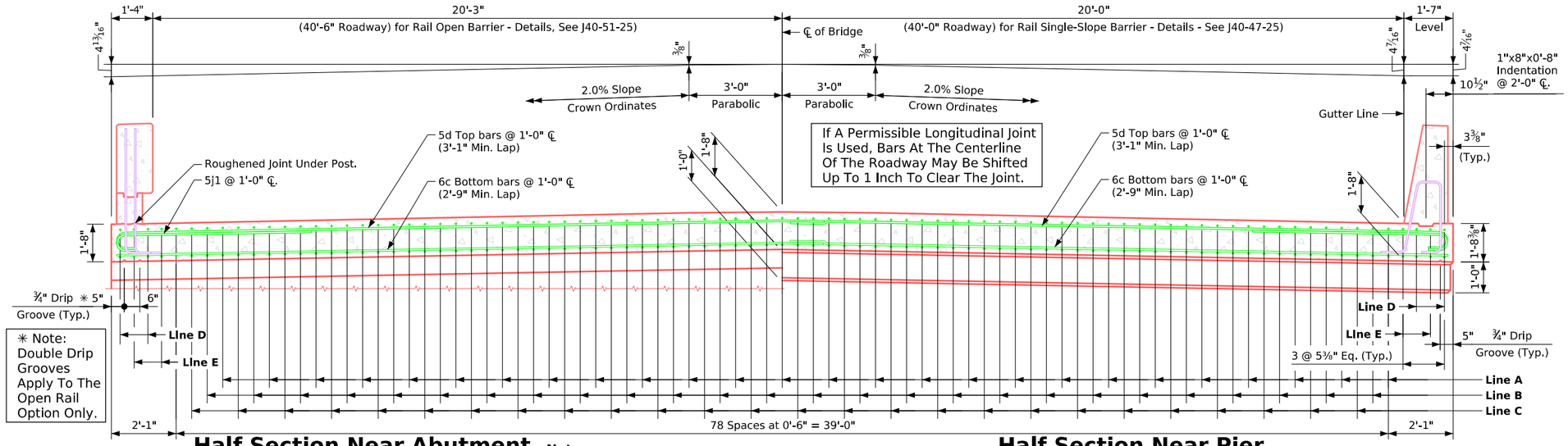
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 71.94 sq. ft.

Note:

Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

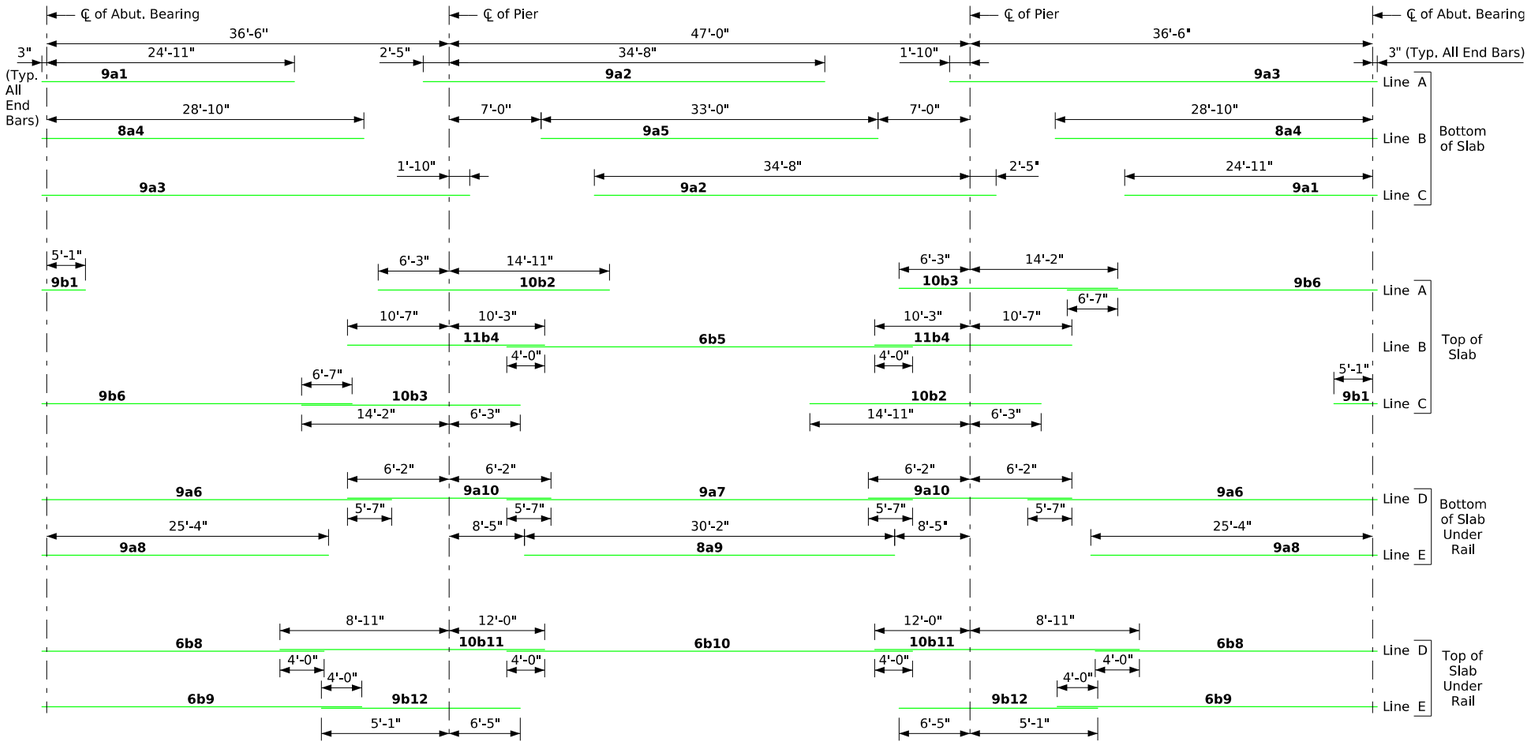
Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.

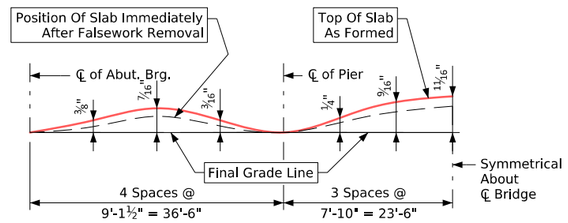
Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 71.99 sq. ft.

I.M. 451.01 Requirements Shall Apply For Bar Chairs.



120' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
120'-0" Bridge

J40-12-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note.

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Epoxy Steel Reinforcing for Superstructure-120' Bridge

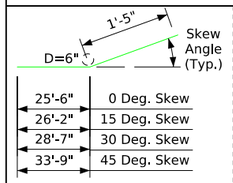
Location	Skew / Shape	Bar	0° No.	0° Length	0° Weight	15° No.	15° Length	15° Weight	30° No.	30° Length	30° Weight	45° No.	45° Length	45° Weight
Slab Longitudinal Bottom		9a1	53	25' - 2"	4536	53	25' - 2"	4536	53	25' - 2"	4536	53	25' - 2"	4536
Slab Longitudinal Bottom		9a2	53	37' - 1"	6683	53	37' - 1"	6683	53	37' - 1"	6683	53	37' - 1"	6683
Slab Longitudinal Bottom		9a3	53	38' - 7"	6953	53	38' - 7"	6953	53	38' - 7"	6953	53	38' - 7"	6953
Slab Longitudinal Bottom		8a4	52	29' - 1"	4038	52	29' - 1"	4038	52	29' - 1"	4038	52	29' - 1"	4038
Slab Longitudinal Bottom		9a5	26	33' - 0"	2918	26	33' - 0"	2918	26	33' - 0"	2918	26	33' - 0"	2918
Slab Longitudinal Bottom, at Rail		9a6	8	36' - 2"	984	8	36' - 2"	984	8	36' - 2"	984	8	36' - 2"	984
Slab Longitudinal Bottom, at Rail		9a7	4	45' - 10"	624	4	45' - 10"	624	4	45' - 10"	624	4	45' - 10"	624
Slab Longitudinal Bottom, at Rail		9a8	8	25' - 7"	696	8	25' - 7"	696	8	25' - 7"	696	8	25' - 7"	696
Slab Longitudinal Bottom, at Rail		8a9	4	30' - 2"	323	4	30' - 2"	323	4	30' - 2"	323	4	30' - 2"	323
Slab Longitudinal Bottom, at Rail		9a10	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336
Slab Longitudinal Top		9b1	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367
Slab Longitudinal Top		10b2	53	21' - 2"	4828	53	21' - 2"	4828	53	21' - 2"	4828	53	21' - 2"	4828
Slab Longitudinal Top		10b3	53	20' - 5"	4657	53	20' - 5"	4657	53	20' - 5"	4657	53	20' - 5"	4657
Slab Longitudinal Top		11b4	52	20' - 10"	5756	52	20' - 10"	5756	52	20' - 10"	5756	52	20' - 10"	5756
Slab Longitudinal Top		6b5	26	34' - 6"	1348	26	34' - 6"	1348	26	34' - 6"	1348	26	34' - 6"	1348
Slab Longitudinal Top		9b6	53	31' - 5"	5662	53	31' - 5"	5662	53	31' - 5"	5662	53	31' - 5"	5662
Slab Longitudinal Top, at Rail		6b8	8	34' - 1"	410	8	34' - 1"	410	8	34' - 1"	410	8	34' - 1"	410
Slab Longitudinal Top, at Rail		6b9	8	37' - 11"	456	8	37' - 11"	456	8	37' - 11"	456	8	37' - 11"	456
Slab Longitudinal Top, at Rail		6b10	4	31' - 0"	187	4	31' - 0"	187	4	31' - 0"	187	4	31' - 0"	187
Slab Longitudinal Top, at Rail		10b11	8	20' - 11"	721	8	20' - 11"	721	8	20' - 11"	721	8	20' - 11"	721
Slab Longitudinal Top, at Rail		9b12	8	11' - 6"	313	8	11' - 6"	313	8	11' - 6"	313	8	11' - 6"	313
Slab Transverse Bottom		6c1	117	24' - 4"	4277	117	25' - 2"	4423	107	24' - 4"	3911	97	24' - 4"	3546
Slab Transverse Bottom		6c2	117	21' - 3"	3735	117	22' - 0"	3867	109	21' - 3"	3480	101	21' - 3"	3224
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311
Slab Transverse Top		5d1	117	25' - 3"	3082	117	26' - 1"	3183	107	25' - 3"	2818	97	25' - 3"	2555
Slab Transverse Top		5d2	117	21' - 10"	2665	117	22' - 7"	2756	109	21' - 10"	2483	101	21' - 10"	2300
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818
Top of Slab, Transverse, at Rail		5j1	232	6' - 9"	1634	232	6' - 9"	1634	222	6' - 9"	1563	216	6' - 9"	1521
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334
Epoxy Reinforcing Total Weight (lbs)					73,533			74,083			74,225			74,704
Single-slope barrier rail - See Sheet J40-48-25.					5108			5108			5108			5108
Open barrier rail - See Sheet J40-52-25.					5967			5967			5967			5967
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap	Single Slope Rail			78,641			79,191			79,333			79,812
		Open Rail			79,500			80,050			80,192			80,671
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap	Single Slope Rail			78,641			79,191			79,333			79,812
		Open Rail			79,500			80,050			80,192			80,671
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap	Single Slope Rail			2640			2640			2640			2640
		Open Rail			2371			2371			2371			2371

Estimated Quantities for Superstructure 120' Bridge

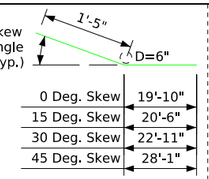
Item	Monolithic Cap 0°	15°	30°	45°	Non-Monolithic Cap 0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	342.8	343.6	345.6	350.5	346.2	346.9	349.5	355.1
Reinf. Steel Epoxy Coated (lbs.)	78,617	79,167	79,309	79,792	78,617	79,167	79,309	79,792
Δ Reinf. Steel Stainless Steel (lbs.)	2863	2863	2863	2863	2863	2863	2863	2863
Concrete single-slope barrier or open rail (lin.ft.)	262	262.2	262.9	264.5	262	262.2	262.9	264.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	342.6	343.3	345.4	350.4	346	346.7	349.3	354.9
Reinf. Steel Epoxy Coated (lbs.)	79,476	80,026	80,168	80,651	79,476	80,026	80,168	80,651
Δ Reinf. Steel Stainless Steel (lbs.)	2594	2594	2594	2594	2594	2594	2594	2594

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

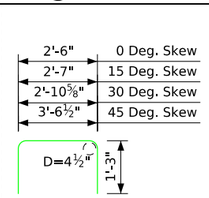
120'-0 Bridge-Bent Bar Details



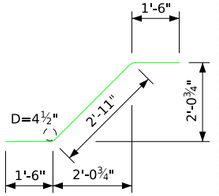
8e1



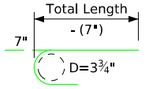
8e2



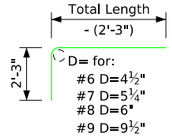
6e3



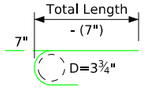
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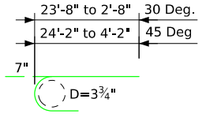
5j1



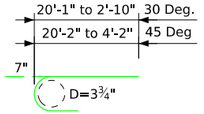
9b1, 9b6, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure
(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for **"Reinforcing Steel, Stainless Steel"**. Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

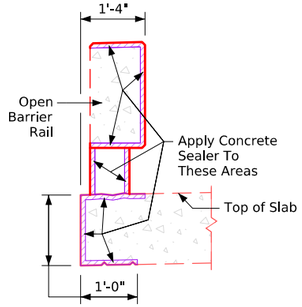
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
120'-0" Bridge Quantities

J40-13-25

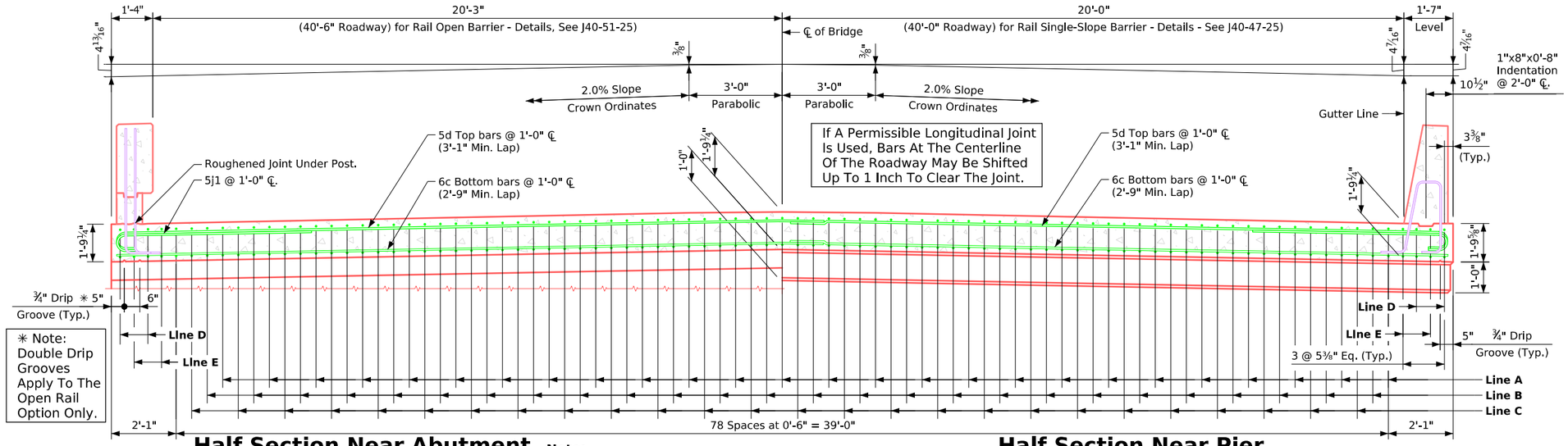
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars. Changed 6b8 and 6b9 bars (was 8b8 and 8b9).



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 76.44 sq. ft.

Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 76.49 sq. ft.

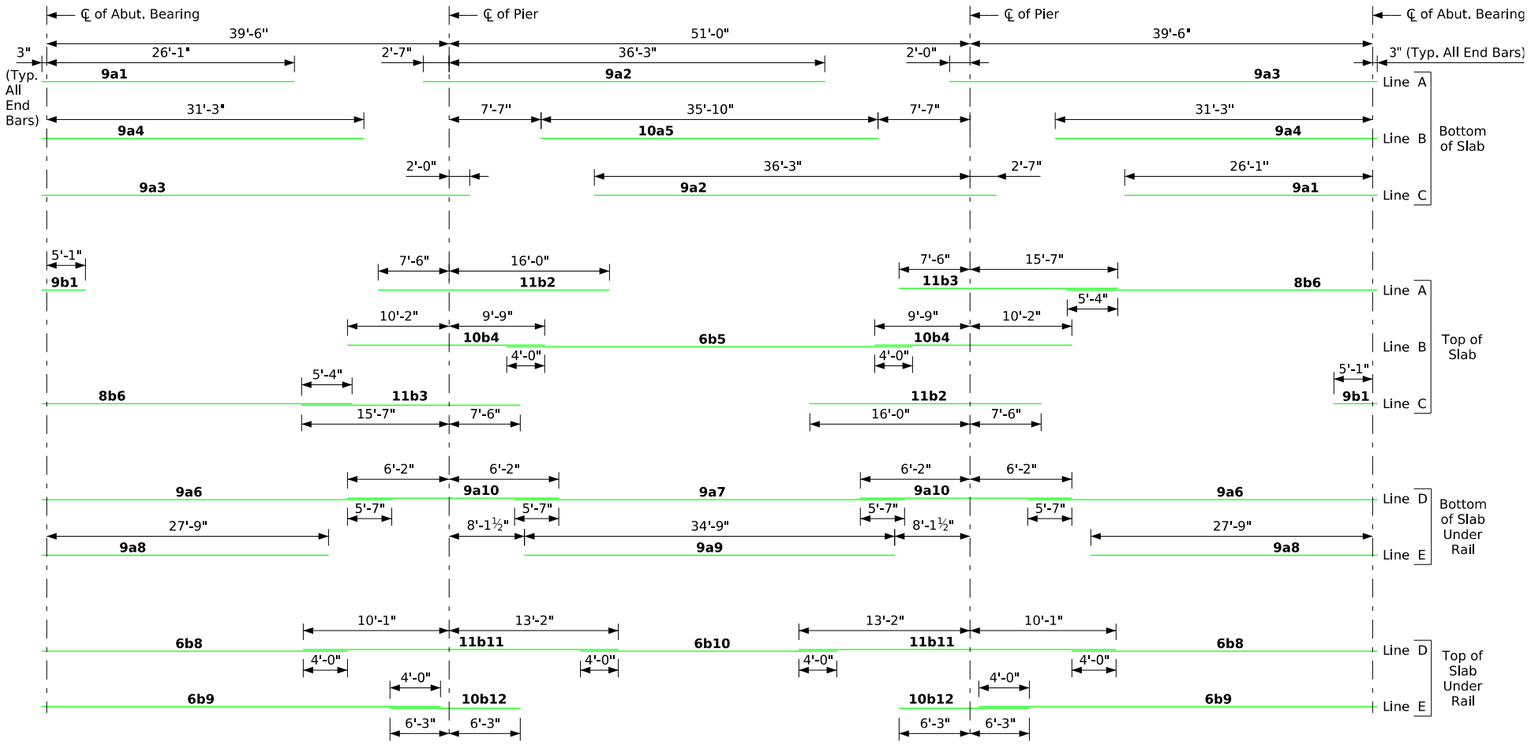
I.M. 451.01 Requirements Shall Apply For Bar Chairs.

Note:

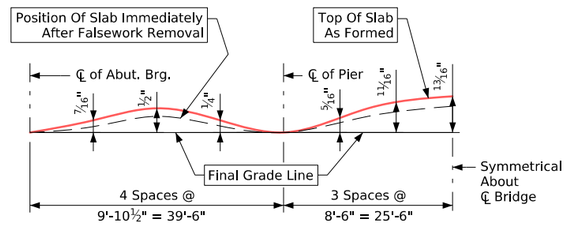
Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.



130' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details 130'-0" Bridge

J40-14-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note.

Epoxy Steel Reinforcing for Superstructure-130' Bridge

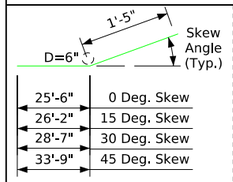
	Skew	0°				15°				30°				45°			
Location	Shape	Bar	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight			
Slab Longitudinal Bottom		9a1	53	26' - 4"	4746	53	26' - 4"	4746	53	26' - 4"	4746	53	26' - 4"	4746			
Slab Longitudinal Bottom		9a2	53	38' - 10"	6998	53	38' - 10"	6998	53	38' - 10"	6998	53	38' - 10"	6998			
Slab Longitudinal Bottom		9a3	53	41' - 9"	7524	53	41' - 9"	7524	53	41' - 9"	7524	53	41' - 9"	7524			
Slab Longitudinal Bottom		9a4	52	31' - 6"	5570	52	31' - 6"	5570	52	31' - 6"	5570	52	31' - 6"	5570			
Slab Longitudinal Bottom		10a5	26	35' - 10"	4009	26	35' - 10"	4009	26	35' - 10"	4009	26	35' - 10"	4009			
Slab Longitudinal Bottom, at Rail		9a6	8	39' - 2"	1066	8	39' - 2"	1066	8	39' - 2"	1066	8	39' - 2"	1066			
Slab Longitudinal Bottom, at Rail		9a7	4	49' - 10"	678	4	49' - 10"	678	4	49' - 10"	678	4	49' - 10"	678			
Slab Longitudinal Bottom, at Rail		9a8	8	28' - 0"	762	8	28' - 0"	762	8	28' - 0"	762	8	28' - 0"	762			
Slab Longitudinal Bottom, at Rail		9a9	4	34' - 9"	473	4	34' - 9"	473	4	34' - 9"	473	4	34' - 9"	473			
Slab Longitudinal Bottom, at Rail		9a10	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336			
Slab Longitudinal Top		9b1	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367	53	7' - 7"	1367			
Slab Longitudinal Top		11b2	53	23' - 6"	6618	53	23' - 6"	6618	53	23' - 6"	6618	53	23' - 6"	6618			
Slab Longitudinal Top		11b3	53	23' - 1"	6501	53	23' - 1"	6501	53	23' - 1"	6501	53	23' - 1"	6501			
Slab Longitudinal Top		10b4	52	19' - 11"	4457	52	19' - 11"	4457	52	19' - 11"	4457	52	19' - 11"	4457			
Slab Longitudinal Top		6b5	26	39' - 8"	1550	26	39' - 8"	1550	26	39' - 8"	1550	26	39' - 8"	1550			
Slab Longitudinal Top		8b6	53	31' - 9"	4493	53	31' - 9"	4493	53	31' - 9"	4493	53	31' - 9"	4493			
Slab Longitudinal Top, at Rail		6b8	8	35' - 11"	432	8	35' - 11"	432	8	35' - 11"	432	8	35' - 11"	432			
Slab Longitudinal Top, at Rail		6b9	8	39' - 9"	478	8	39' - 9"	478	8	39' - 9"	478	8	39' - 9"	478			
Slab Longitudinal Top, at Rail		6b10	4	32' - 8"	197	4	32' - 8"	197	4	32' - 8"	197	4	32' - 8"	197			
Slab Longitudinal Top, at Rail		11b11	8	23' - 3"	989	8	23' - 3"	989	8	23' - 3"	989	8	23' - 3"	989			
Slab Longitudinal Top, at Rail		10b12	8	12' - 6"	431	8	12' - 6"	431	8	12' - 6"	431	8	12' - 6"	431			
Slab Transverse Bottom		6c1	127	24' - 4"	4642	127	25' - 2"	4801	117	24' - 4"	4277	107	24' - 4"	3911			
Slab Transverse Bottom		6c2	127	21' - 3"	4054	127	22' - 0"	4197	119	21' - 3"	3799	111	21' - 3"	3543			
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447			
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386			
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298			
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311			
Slab Transverse Top		5d1	127	25' - 3"	3345	127	26' - 1"	3456	117	25' - 3"	3082	107	25' - 3"	2818			
Slab Transverse Top		5d2	127	21' - 10"	2893	127	22' - 7"	2992	119	21' - 10"	2710	111	21' - 10"	2528			
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324			
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275			
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207			
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227			
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691			
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418			
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841			
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818			
Top of Slab, Transverse, at Rail		5j1	252	6' - 9"	1775	252	6' - 9"	1775	242	6' - 9"	1704	236	6' - 9"	1662			
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185			
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334			
Epoxy Reinforcing Total Weight (lbs)					80,728			81,320			81,421			81,899			
Single-slope barrier rail - See Sheet J40-48-25.					5429			5429			5429			5429			
Open barrier rail - See Sheet J40-52-25.					6331			6331			6331			6331			
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap			Single Slope Rail	86,157			86,749			86,850			87,328			
				Open Rail	87,059			87,651			87,752			88,230			
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	86,157			86,749			86,850			87,328			
				Open Rail	87,059			87,651			87,752			88,230			
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	2855			2855			2855			2855			
				Open Rail	2539			2539			2539			2539			

Estimated Quantities for Superstructure 130' Bridge

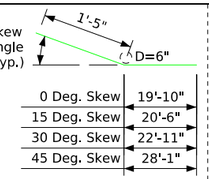
	Monolithic Cap				Non-Monolithic Cap			
Item	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	390.6	391.4	393.4	398.1	394	394.7	397.3	402.8
Reinf. Steel Epoxy Coated (lbs.)	86,133	86,725	86,826	87,308	86,133	86,725	86,826	87,308
Δ Reinf. Steel Stainless Steel (lbs.)	3078	3078	3078	3078	3078	3078	3078	3078
Concrete single-slope barrier or open rail (lin.ft.)	282	282.2	282.9	284.5	282	282.2	282.9	284.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	390.4	391.1	393.1	397.9	394	394.7	397.3	402.6
Reinf. Steel Epoxy Coated (lbs.)	87,035	97,627	87,728	88,210	87,035	87,627	87,728	88,210
Δ Reinf. Steel Stainless Steel (lbs.)	2762	2762	2762	2762	2762	2762	2762	2762

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

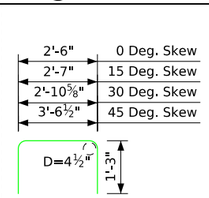
130'-0 Bridge-Bent Bar Details



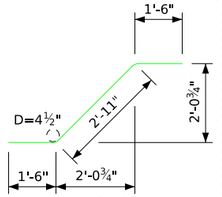
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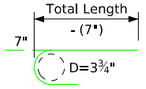
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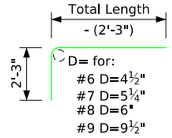
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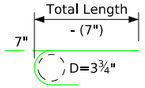
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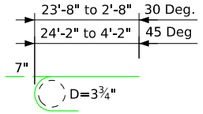
5j1



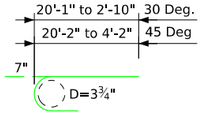
9b1, 8b6, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure

(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for **"Reinforcing Steel, Stainless Steel"**. Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

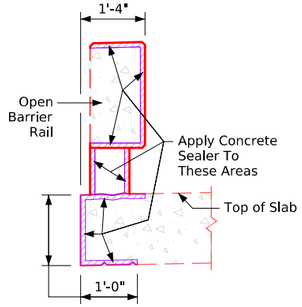
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
130'-0" Bridge Quantities

J40-15-25

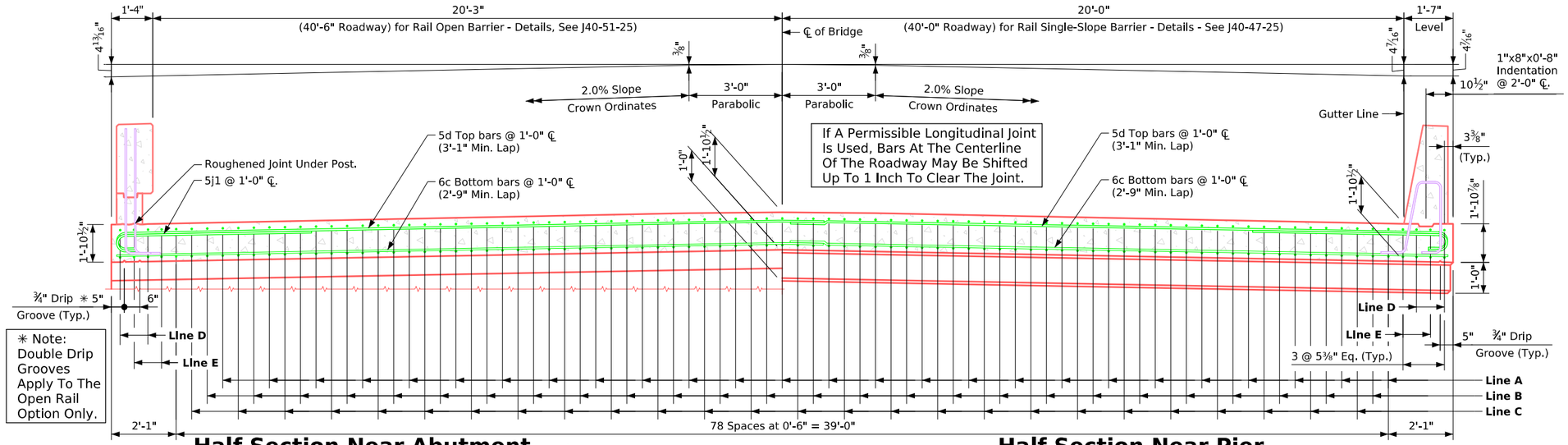
Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

Slab Cross-Section Area For Open Rail = 80.94 sq. ft.

Note:

Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.

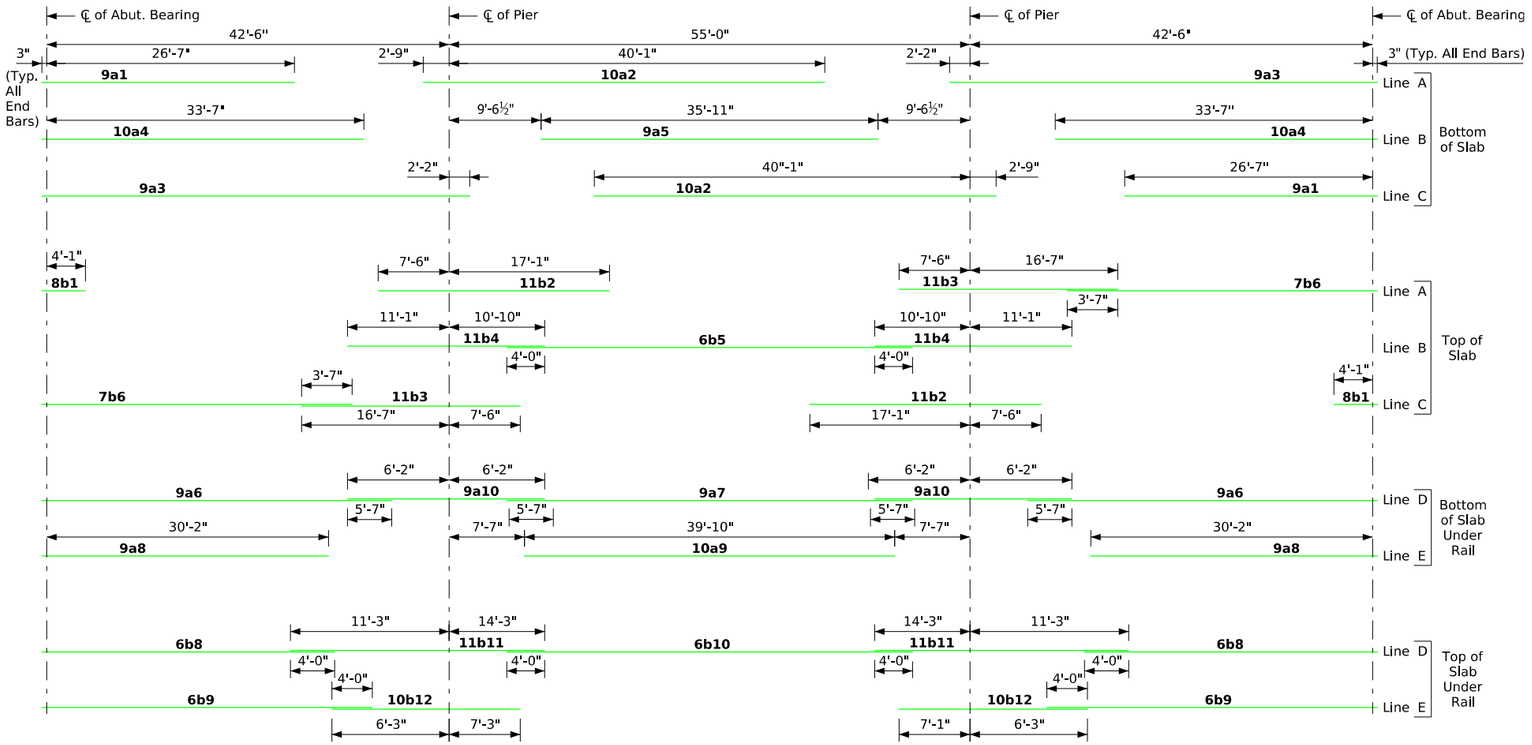
Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.

Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.

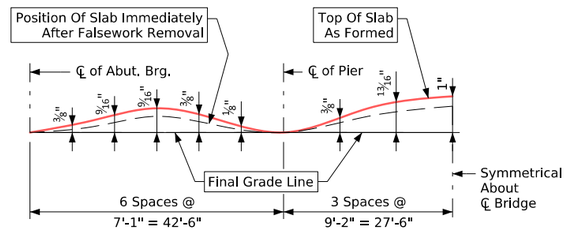
Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 80.99 sq. ft.

I.M. 451.01 Requirements Shall Apply For Bar Chairs.



140' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
140'-0" Bridge

J40-16-25

Revised 09-2026: Updated Bridge Engineer signature. Updated "Concrete Sealer" note.

Epoxy Steel Reinforcing for Superstructure-140' Bridge

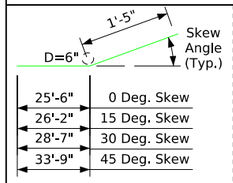
	Skew	0°				15°				30°				45°			
Location	Shape	Bar	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight			
Slab Longitudinal Bottom		9a1	53	26' - 10"	4836	53	26' - 10"	4836	53	26' - 10"	4836	53	26' - 10"	4836			
Slab Longitudinal Bottom		10a2	53	42' - 10"	9769	53	42' - 10"	9769	53	42' - 10"	9769	53	42' - 10"	9769			
Slab Longitudinal Bottom		9a3	53	44' - 11"	8094	53	44' - 11"	8094	53	44' - 11"	8094	53	44' - 11"	8094			
Slab Longitudinal Bottom		10a4	52	33' - 10"	7571	52	33' - 10"	7571	52	33' - 10"	7571	52	33' - 10"	7571			
Slab Longitudinal Bottom		9a5	26	35' - 11"	3176	26	35' - 11"	3176	26	35' - 11"	3176	26	35' - 11"	3176			
Slab Longitudinal Bottom, at Rail		9a6	8	42' - 2"	1147	8	42' - 2"	1147	8	42' - 2"	1147	8	42' - 2"	1147			
Slab Longitudinal Bottom, at Rail		9a7	4	53' - 10"	733	4	53' - 10"	733	4	53' - 10"	733	4	53' - 10"	733			
Slab Longitudinal Bottom, at Rail		9a8	8	30' - 5"	828	8	30' - 5"	828	8	30' - 5"	828	8	30' - 5"	828			
Slab Longitudinal Bottom, at Rail		10a9	4	39' - 10"	686	4	39' - 10"	686	4	39' - 10"	686	4	39' - 10"	686			
Slab Longitudinal Bottom, at Rail		9a10	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336			
Slab Longitudinal Top		8b1	53	6' - 7"	932	53	6' - 7"	932	53	6' - 7"	932	53	6' - 7"	932			
Slab Longitudinal Top		11b2	53	24' - 7"	6923	53	24' - 7"	6923	53	24' - 7"	6923	53	24' - 7"	6923			
Slab Longitudinal Top		11b3	53	26' - 0"	7322	53	26' - 0"	7322	53	26' - 0"	7322	53	26' - 0"	7322			
Slab Longitudinal Top		11b4	52	21' - 11"	6056	52	21' - 11"	6056	52	21' - 11"	6056	52	21' - 11"	6056			
Slab Longitudinal Top		6b5	26	41' - 4"	1615	26	41' - 4"	1615	26	41' - 4"	1615	26	41' - 4"	1615			
Slab Longitudinal Top		7b6	53	30' - 1"	3259	53	30' - 1"	3259	53	30' - 1"	3259	53	30' - 1"	3259			
Slab Longitudinal Top, at Rail		6b8	8	37' - 9"	454	8	37' - 9"	454	8	37' - 9"	454	8	37' - 9"	454			
Slab Longitudinal Top, at Rail		6b9	8	42' - 9"	514	8	42' - 9"	514	8	42' - 9"	514	8	42' - 9"	514			
Slab Longitudinal Top, at Rail		6b10	4	34' - 6"	208	4	34' - 6"	208	4	34' - 6"	208	4	34' - 6"	208			
Slab Longitudinal Top, at Rail		11b11	8	25' - 6"	1084	8	25' - 6"	1084	8	25' - 6"	1084	8	25' - 6"	1084			
Slab Longitudinal Top, at Rail		10b12	8	13' - 6"	465	8	13' - 6"	465	8	13' - 6"	465	8	13' - 6"	465			
Slab Transverse Bottom		6c1	137	24' - 4"	5008	137	25' - 2"	5179	127	24' - 4"	4642	117	24' - 4"	4277			
Slab Transverse Bottom		6c2	137	21' - 3"	4373	137	22' - 0"	4528	129	21' - 3"	4118	121	21' - 3"	3863			
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447			
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386			
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298			
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311			
Slab Transverse Top		5d1	137	25' - 3"	3608	137	26' - 1"	3728	127	25' - 3"	3345	117	25' - 3"	3082			
Slab Transverse Top		5d2	137	21' - 10"	3120	137	22' - 7"	3227	129	21' - 10"	2938	121	21' - 10"	2756			
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324			
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275			
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207			
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227			
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691			
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418			
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841			
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818			
Top of Slab, Transverse, at Rail		5j1	272	6' - 9"	1915	272	6' - 9"	1915	262	6' - 9"	1845	256	6' - 9"	1803			
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185			
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334			
Epoxy Reinforcing Total Weight (lbs)					88,376			89,009			89,070			89,551			
Single-slope barrier rail - See Sheet J40-48-25.					5827			5827			5827			5827			
Open barrier rail - See Sheet J40-52-25.					6774			6774			6774			6774			
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap			Single Slope Rail	94,203			94,836			94,897			95,378			
				Open Rail	95,150			95,783			95,844			96,325			
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	94,203			94,836			94,897			95,378			
				Open Rail	95,150			95,783			95,844			96,325			
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap			Single Slope Rail	3096			3096			3096			3096			
				Open Rail	2711			2711			2711			2711			

Estimated Quantities for Superstructure 140' Bridge

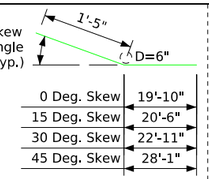
	Monolithic Cap				Non-Monolithic Cap			
Item	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	441.8	442.5	444.4	449.1	445.1	445.9	448.3	453.7
Reinf. Steel Epoxy Coated (lbs.)	95,156	95,789	95,850	96,335	95,156	95,789	95,850	96,335
Δ Reinf. Steel Stainless Steel (lbs.)	3319	3319	3319	3319	3319	3319	3319	3319
Concrete single-slope barrier or open rail (lin.ft.)	302	302.2	302.9	304.5	302	302.2	302.9	304.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	441.5	442.2	444.2	448.2	444.9	445.6	448.1	453.4
Reinf. Steel Epoxy Coated (lbs.)	96,103	96,736	96,797	97,282	96,103	96,736	96,797	97,282
Δ Reinf. Steel Stainless Steel (lbs.)	2934	2934	2934	2934	2934	2934	2934	2934

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

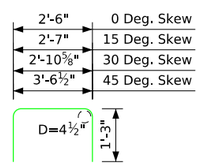
140'-0 Bridge-Bent Bar Details



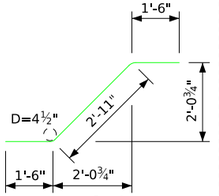
8e1



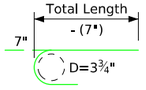
8e2



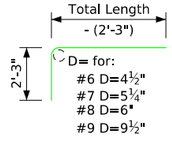
6e3



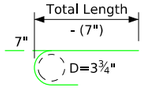
6e4



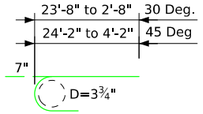
5j1



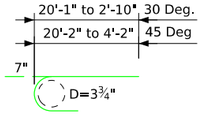
8b1, 7b6, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure
(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for **"Reinforcing Steel, Stainless Steel"**. Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

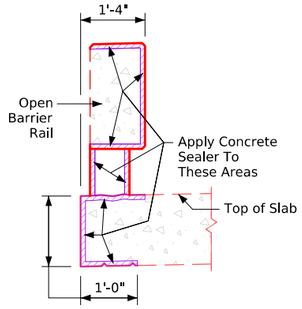
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
140'-0" Bridge Quantities

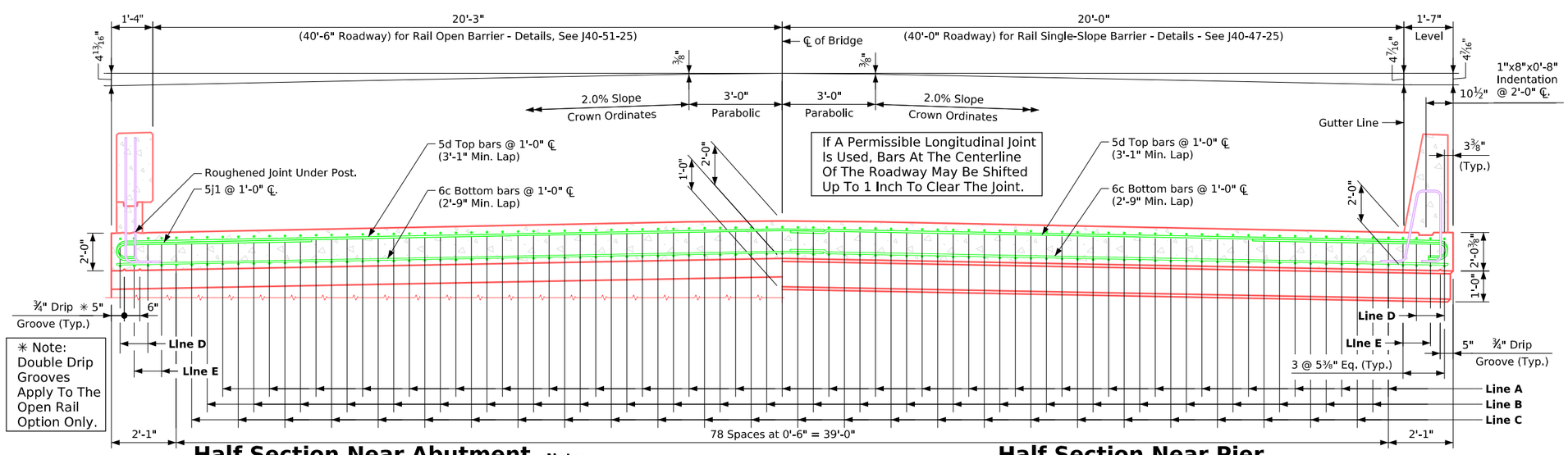
J40-17-25

Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars. Changed 7b6 bar (was 8b6).



Concrete Sealer Application Limits Open Rail Section

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side, bottom of rail, and on all sides of the open rail posts.
The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with **Article 2403.03,P.3** of the **Standard Specifications** and **Materials I.M. 491.12**.



Half Section Near Abutment

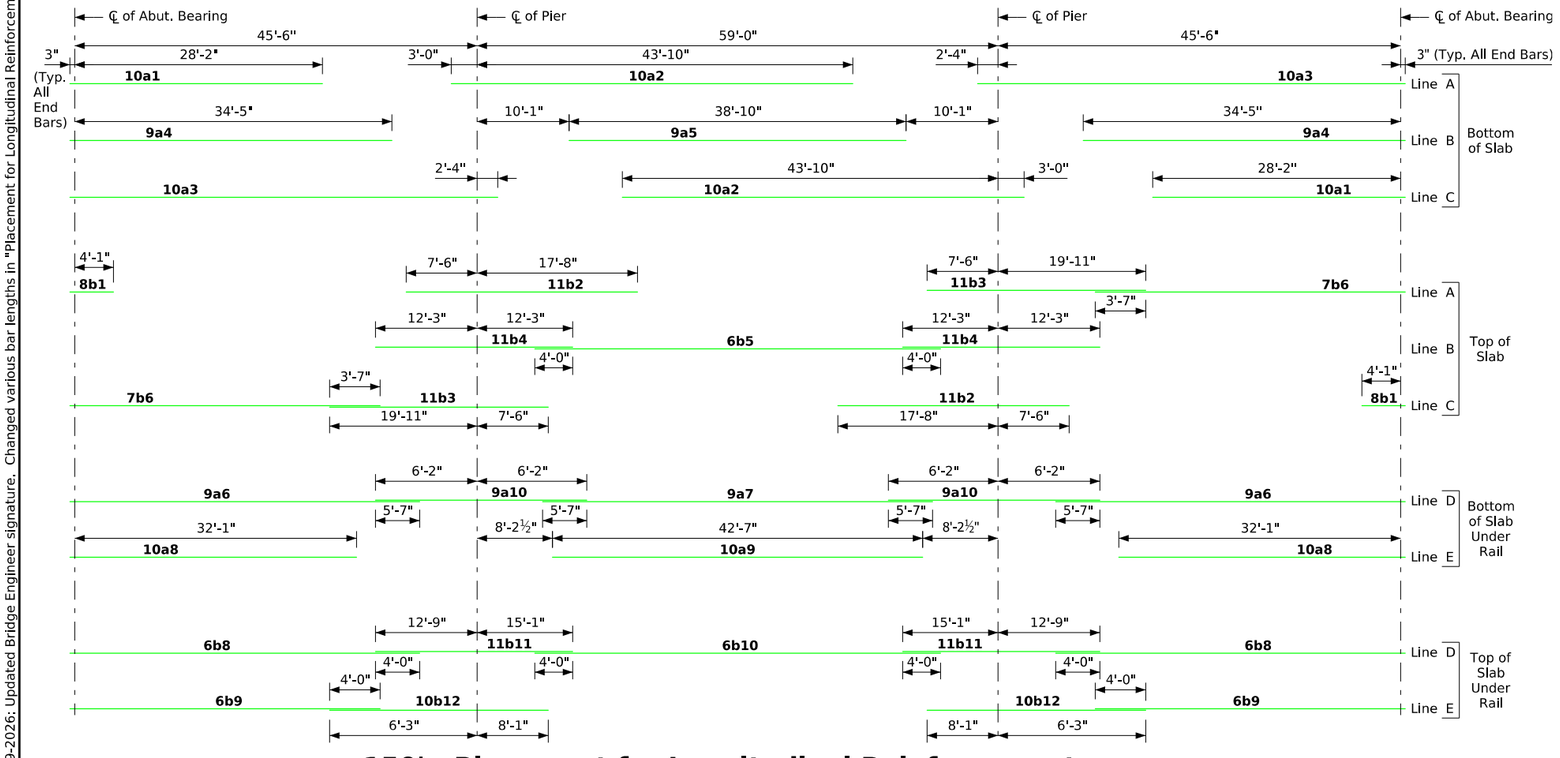
Slab Cross-Section Area For Open Rail = 86.33 sq. ft.

Note:
Top longitudinal reinforcing steel shall be parallel to and 2¾ inches clear below the top of the slab.
Bottom longitudinal reinforcing steel shall be parallel to and 1½ inches clear above the bottom of the slab.
Reinforcing steel shall be securely wired in place and adequately supported on bar chairs before concrete placement.

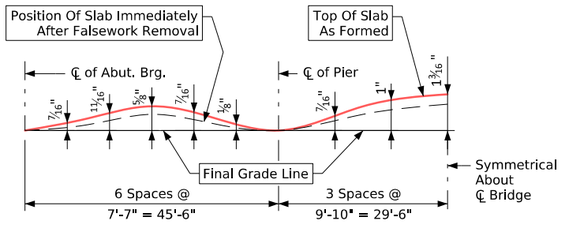
Half Section Near Pier

Slab Cross-Section Area For Single-Slope Barrier Rail = 86.38 sq. ft.

I.M. 451.01 Requirements Shall Apply For Bar Chairs.



150' - Placement for Longitudinal Reinforcement



Form Camber Diagram

This diagram illustrates the form camber required to compensate for the anticipated ultimate dead load deflection. The dimensions shown do not account for form deflection or falsework settlement.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
150'-0" Bridge

J40-18-25

Revised 09-2026: Updated Bridge Engineer signature. Changed various bar lengths in "Placement for Longitudinal Reinforcement" detail. Updated "Concrete Sealer" note.

Epoxy Steel Reinforcing for Superstructure-150' Bridge

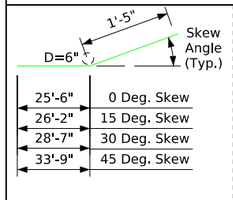
	Skew	0°				15°				30°				45°			
Location	Shape	Bar	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight			
Slab Longitudinal Bottom		10a1	53	28' - 5"	6481	53	28' - 5"	6481	53	28' - 5"	6481	53	28' - 5"	6481			
Slab Longitudinal Bottom		10a2	53	46' - 10"	10,681	53	46' - 10"	10,681	53	46' - 10"	10,681	53	46' - 10"	10,681			
Slab Longitudinal Bottom		10a3	53	48' - 1"	10,966	53	48' - 1"	10,966	53	48' - 1"	10,966	53	48' - 1"	10,966			
Slab Longitudinal Bottom		9a4	52	34' - 8"	6130	52	34' - 8"	6130	52	34' - 8"	6130	52	34' - 8"	6130			
Slab Longitudinal Bottom		9a5	26	38' - 10"	3433	26	38' - 10"	3433	26	38' - 10"	3433	26	38' - 10"	3433			
Slab Longitudinal Bottom, at Rail		9a6	8	45' - 2"	1229	8	45' - 2"	1229	8	45' - 2"	1229	8	45' - 2"	1229			
Slab Longitudinal Bottom, at Rail		9a7	4	57' - 10"	787	4	57' - 10"	787	4	57' - 10"	787	4	57' - 10"	787			
Slab Longitudinal Bottom, at Rail		10a8	8	32' - 4"	1114	8	32' - 4"	1114	8	32' - 4"	1114	8	32' - 4"	1114			
Slab Longitudinal Bottom, at Rail		10a9	4	42' - 7"	733	4	42' - 7"	733	4	42' - 7"	733	4	42' - 7"	733			
Slab Longitudinal Bottom, at Rail		9a10	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336	8	12' - 4"	336			
Slab Longitudinal Top		8b1	53	6' - 7"	932	53	6' - 7"	932	53	6' - 7"	932	53	6' - 7"	932			
Slab Longitudinal Top		11b2	53	25' - 2"	7087	53	25' - 2"	7087	53	25' - 2"	7087	53	25' - 2"	7087			
Slab Longitudinal Top		11b3	53	27' - 5"	7721	53	27' - 5"	7721	53	27' - 5"	7721	53	27' - 5"	7721			
Slab Longitudinal Top		11b4	52	24' - 6"	6769	52	24' - 6"	6769	52	24' - 6"	6769	52	24' - 6"	6769			
Slab Longitudinal Top		6b5	26	42' - 6"	1660	26	42' - 6"	1660	26	42' - 6"	1660	26	42' - 6"	1660			
Slab Longitudinal Top		7b6	53	31' - 8"	3431	53	31' - 8"	3431	53	31' - 8"	3431	53	31' - 8"	3431			
Slab Longitudinal Top, at Rail		6b8	8	39' - 3"	472	8	39' - 3"	472	8	39' - 3"	472	8	39' - 3"	472			
Slab Longitudinal Top, at Rail		6b9	8	45' - 9"	550	8	45' - 9"	550	8	45' - 9"	550	8	45' - 9"	550			
Slab Longitudinal Top, at Rail		6b10	4	36' - 10"	222	4	36' - 10"	222	4	36' - 10"	222	4	36' - 10"	222			
Slab Longitudinal Top, at Rail		11b11	8	27' - 10"	1184	8	27' - 10"	1184	8	27' - 10"	1184	8	27' - 10"	1184			
Slab Longitudinal Top, at Rail		10b12	8	14' - 4"	494	8	14' - 4"	494	8	14' - 4"	494	8	14' - 4"	494			
Slab Transverse Bottom		6c1	147	24' - 4"	5373	147	25' - 2"	5557	137	24' - 4"	5008	127	24' - 4"	4642			
Slab Transverse Bottom		6c2	147	21' - 3"	4692	147	22' - 0"	4858	139	21' - 3"	4437	131	21' - 3"	4182			
Slab Transverse Ends, Bottom		6c3	-	-	-	-	-	-	13	VARIES	262	21	VARIES	447			
Slab Transverse Ends, Bottom		6c4	-	-	-	-	-	-	11	VARIES	233	20	VARIES	386			
Slab Transverse Ends, Bottom		6c5	-	-	-	-	-	-	10	VARIES	173	17	VARIES	298			
Slab Transverse Ends, Bottom		6c6	-	-	-	-	-	-	11	VARIES	191	17	VARIES	311			
Slab Transverse Top		5d1	147	25' - 3"	3872	147	26' - 1"	4000	137	25' - 3"	3608	127	25' - 3"	3345			
Slab Transverse Top		5d2	147	21' - 10"	3348	147	22' - 7"	3463	139	21' - 10"	3166	131	21' - 10"	2984			
Slab Transverse Ends, Top		5d3	-	-	-	-	-	-	13	VARIES	188	21	VARIES	324			
Slab Transverse Ends, Top		5d4	-	-	-	-	-	-	11	VARIES	166	20	VARIES	275			
Slab Transverse Ends, Top		5d5	-	-	-	-	-	-	10	VARIES	120	17	VARIES	207			
Slab Transverse Ends, Top		5d6	-	-	-	-	-	-	11	VARIES	139	17	VARIES	227			
Slab, Tansverse at Abutment		8e1	18	26' - 11"	1294	18	27' - 7"	1326	18	30' - 0"	1442	18	35' - 2"	1691			
Slab, Tansverse at Abutment		8e2	18	21' - 3"	1022	18	21' - 11"	1058	18	24' - 4"	1174	18	29' - 6"	1418			
Slab, Tansverse at Abutment		6e3	92	5' - 0"	691	92	5' - 1"	703	92	5' - 5"	749	92	6' - 1"	841			
Slab, Tansverse at Abutment		6e4	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818	92	5' - 11"	818			
Top of Slab, Transverse, at Rail		5j1	292	6' - 9"	2056	292	6' - 9"	2056	282	6' - 9"	1986	276	6' - 9"	1944			
Wing, Vertical		5m1	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185	40	4' - 5"	185			
Wing, Horizontal Back Face		5n1	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334	48	6' - 8"	334			
Epoxy Reinforcing Total Weight (lbs)					96,097			96,770			96,791			97,271			
Single-slope barrier rail - See Sheet J40-48-25.					6153			6153			6153			6153			
Open barrier rail - See Sheet J40-52-25.					7146			7146			7146			7146			
Epoxy Coated Rail Total - lbs.	Monolithic Pier Cap	Single Slope Rail			102,250			102,923			102,944			103,424			
		Open Rail			103,243			103,916			103,937			104,417			
Epoxy Coated Rail Total - lbs.	Non-Monolithic Pier Cap	Single Slope Rail			102,250			102,923			102,944			103,424			
		Open Rail			103,243			103,916			103,937			104,417			
Stainless Steel Rail Total - lbs.	Non-Monolithic Pier Cap	Single Slope Rail			3349			3349			3349			3349			
		Open Rail			2925			2925			2925			2925			

Estimated Quantities for Superstructure 150' Bridge

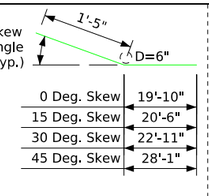
	Monolithic Cap				Non-Monolithic Cap			
Item	0°	15°	30°	45°	0°	15°	30°	45°
With Single-Slope Rail								
* Structural Concrete (Bridge) (c.y.)	501.1	501.9	503.7	508.2	504.5	505.2	507.6	512.8
Reinf. Steel Epoxy Coated (lbs.)	102,226	102,899	102,920	103,404	102,226	102,899	102,920	103,404
Δ Reinf. Steel Stainless Steel (lbs.)	3572	3572	3572	3572	3572	3572	3572	3572
Concrete single-slope barrier or open rail (lin.ft.)	322	322.2	322.9	324.5	322	322.2	322.9	324.5
With Open Rail								
* Structural Concrete (Bridge) (c.y.)	500.9	501.6	503.4	507.9	504.2	504.9	507.3	512.5
Reinf. Steel Epoxy Coated (lbs.)	103,219	103,892	103,913	104,397	103,219	103,892	103,913	104,397
Δ Reinf. Steel Stainless Steel (lbs.)	3148	3148	3148	3148	3148	3148	3148	3148

* Includes 4 wings at 1.114 cubic yard each; excludes rail concrete.
Δ Includes abutment paving notch bar weight.

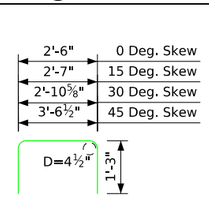
150'-0 Bridge-Bent Bar Details



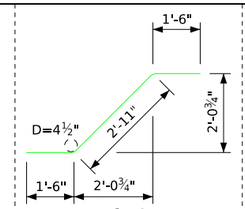
8e1



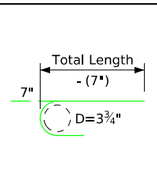
8e2



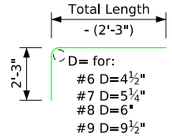
6e3



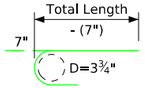
6e4



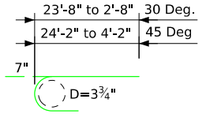
5j1



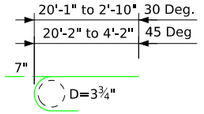
8b1, 7b6, 6b8 and 6b9



5d1 and 5d2



5d3



5d6

Note: All Dimensions Are Out To Out. D=pin Diameter.

Stainless Steel Reinforcing for Superstructure
(All Skews)

Location	Shape	Bar	No.	Length	Weight
Abutment Paving Notch Bar		8u1	40	2'-1	223

8u1 bars are to be paid for under the price bid for **"Reinforcing Steel, Stainless Steel"**. Weight = lbs.

Note:
See J40-26-25 Sheet for Monolithic Pier Cap reinforcing details and quantities.
See J40-28-25 Sheet for Non-Monolithic Pier Cap reinforcing details and quantities.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

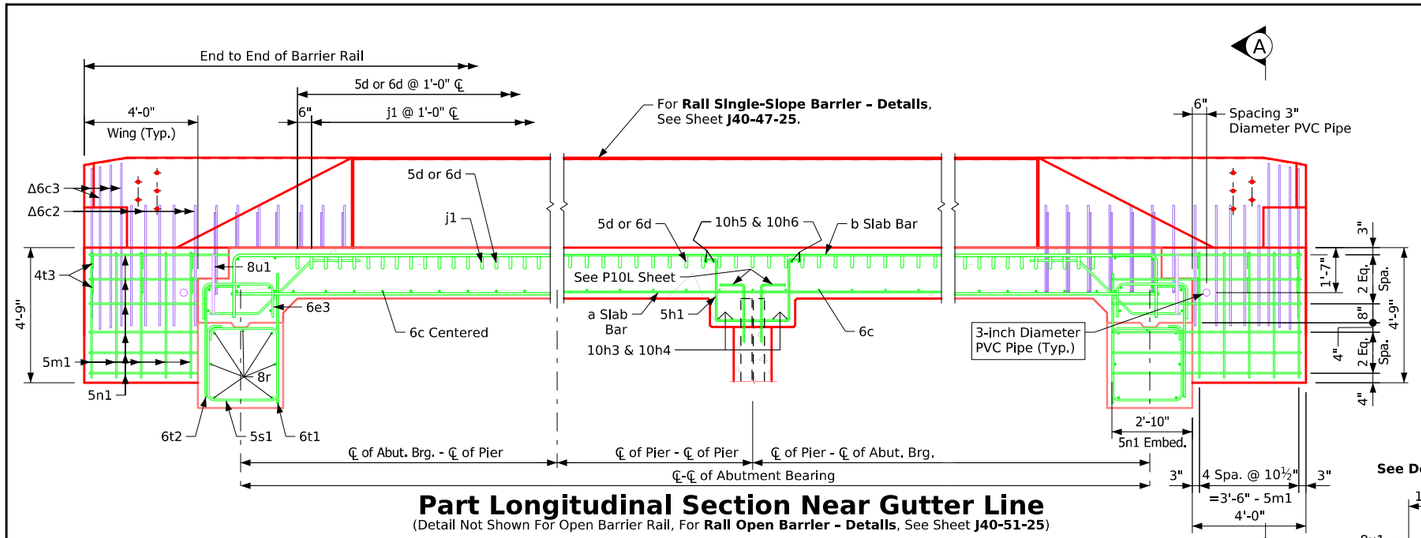
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
150'-0" Bridge Quantities

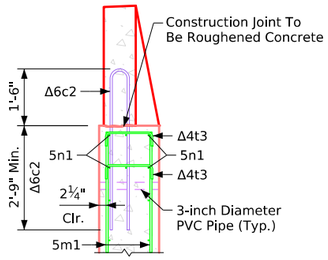
J40-19-25

Revised 09-2026: Updated Bridge Engineer signature. Updated Reinforcing Steel for Superstructure table and horizontal dimensions in Bent Bar Details on 8e1 and 8e2 bars.



Part Longitudinal Section Near Gutter Line

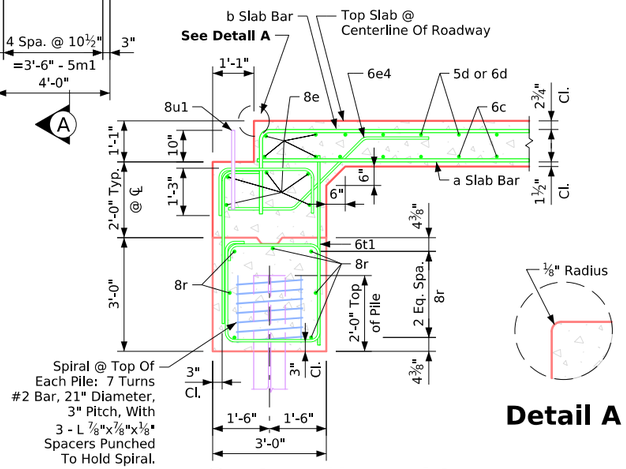
(Detail Not Shown For Open Barrier Rail, For **Rail Open Barrier - Details**, See Sheet **J40-51-25**)



Section A-A

Δ Note: Refer to **Rail Single-Slope Barrier - End Section Details (1 of 2)** sheet on **J40-49-25** for details of the barrier rail end section. Reinforcing 6c2, 5c4, and 4t3 are included in the **Rail Single-Slope Barrier - End Section Details (2 of 2)** sheet on **J40-50-25.**

Note: 5m1 and 5n1 are included in the **Superstructure Quantities** sheet.



Section Normal to Abutment @ ℄

(Bridge Lengths 70-110ft)

Detail A

Superstructure Notes:

This bridge is designed for HL-93 loading plus an allowance of 20 pounds per square foot of roadway for a future wearing surface.

The slab, as shown, includes a 3/4-inch integral wearing surface.

The minimum clear distance from the face of concrete to the nearest reinforcing bar shall be 2 inches unless otherwise noted or shown. All reinforcing steel is to be securely wired in place. See **Bar Chair Note**.

All reinforcing shall be Grade 60.

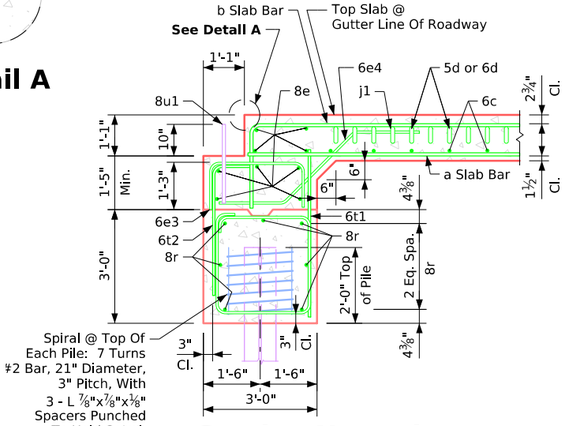
The concrete slab is to be placed with a minimum of construction joints. Procedures for placing slab concrete shall be submitted for approval, together with a statement of the proposed method and evidence that the Contractor possesses the necessary equipment and facilities to accomplish the required result. Slab falsework shall be removed prior to the construction of the barrier rails unless slab construction is staged.

Note that when Portland cement approach pavement is placed, compressible joint material must be used between the pavement and the end of the bridge. If necessary to prevent damage to the end of the bridge deck or backwall from construction equipment, an appropriate method of protection approved by the Engineer shall be provided by the Bridge Contractor at no extra cost to the State.

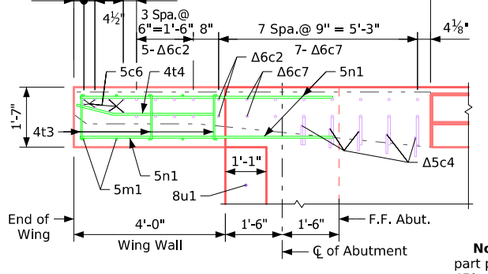
The cost of furnishing and placing a 3-inch diameter PVC pipe in each wing is included in the price bid for "Structural Concrete (Bridge)".

Bar Chair Note:

The top mat of reinforcing steel is to be supported by individual bar chairs spaced at no more than 3'-0" centers longitudinally and transversely. The bottom mat of reinforcing steel is to be supported by individual bar chairs spaced at no more than 3'-0" centers longitudinally and transversely, or by continuous rows of bar high chairs or slab bolsters spaced 4'-0" apart. **I.M. 451.01** requirements shall apply for bar chairs, bar high chairs, and slab bolsters.

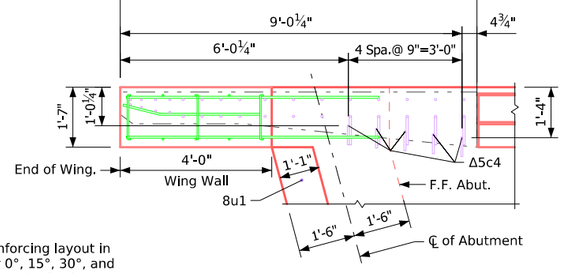


Section Normal to Abutment @ Gutter Line



Part Plan 0° Skew

(End Section Not Shown)

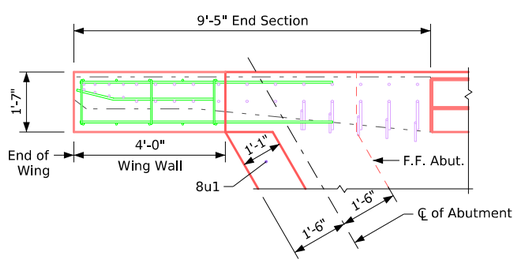


Part Plan 15° Skew

(End Section Not Shown)

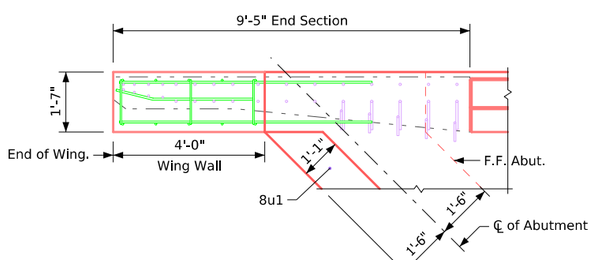
Note: Reinforcing layout in part plans for 0°, 15°, 30°, and 45° skews is for single-sloped barrier rail only. The wing and end section reinforcing layout is the same for all skews.

For **Rail Open Barrier - Details**, see Sheet **J40-51-25**.



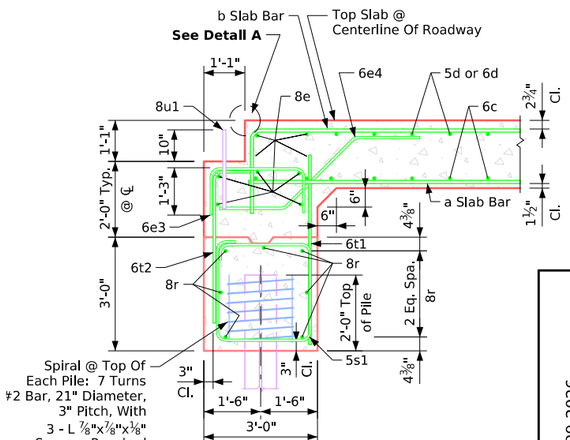
Part Plan 30° Skew

(End Section Not Shown)



Part Plan 45° Skew

(End Section Not Shown)



Section Normal to Abutment @ ℄

(Bridge Lengths 120-150ft)

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

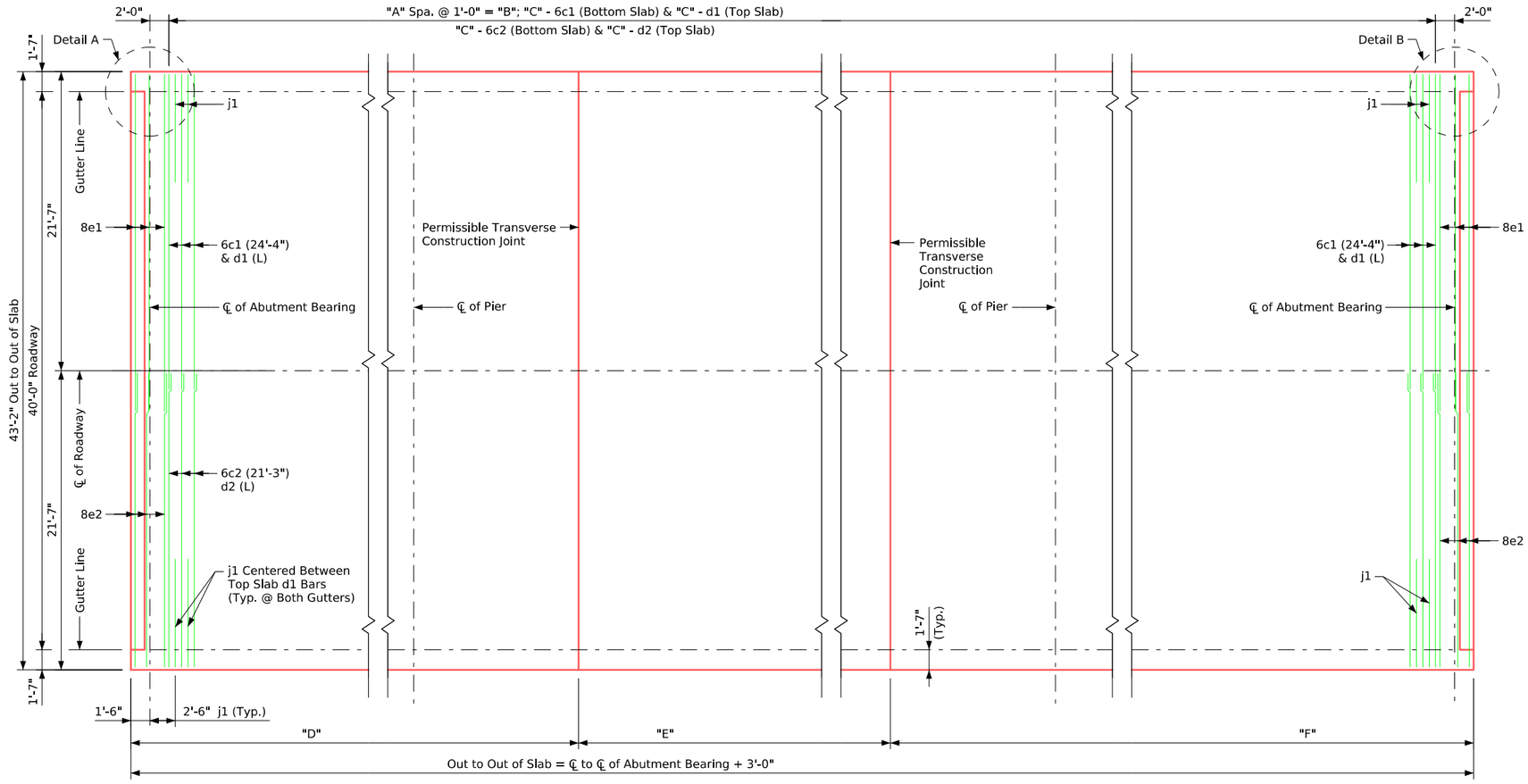
July, 2025

Superstructure General Details

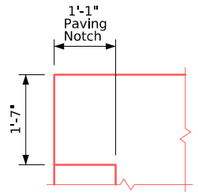
J40-20-25

Revised 09-2026: Updated Bridge Engineer signature.

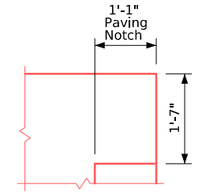
5:14:49 PM 9/4/2026 bkloss pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\J40-25.dgn



0° Skew Transverse Reinforcing Steel Layout



Detail A



Detail B

j1 Bar Size Table

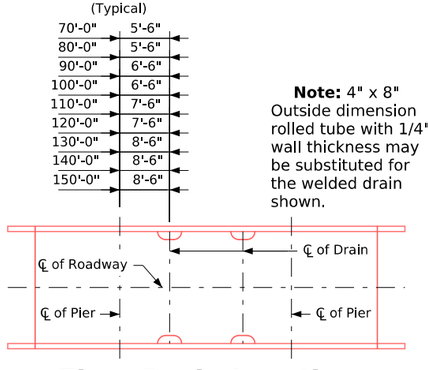
Bridge Length	Bar Size
70' to 90'	7
100' to 110'	6
120' to 150'	5

d Bar Size & Length Table

Bridge Length	Bar Size	d1 (L)	d2(L)
70'	6	25'-10"	21'-11"
80' to 150'	5	25'-3"	21'-10"

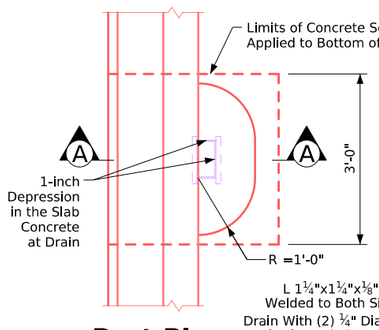
0° Transverse Reinforcement Dimensions – Table

Bridge	"A"	"B"	"C"	"D"	"E"	"F"
70ft	66	66'-0"	67	28'-0"	17'-0"	28'-0"
80ft	76	76'-0"	77	32'-0"	19'-0"	32'-0"
90ft	86	86'-0"	87	36'-0"	21'-0"	36'-0"
100ft	96	96'-0"	97	40'-0"	23'-0"	40'-0"
110ft	106	106'-0"	107	44'-0"	25'-0"	44'-0"
120ft	116	116'-0"	117	48'-0"	27'-0"	48'-0"
130ft	126	126'-0"	127	52'-0"	29'-0"	52'-0"
140ft	136	136'-0"	137	56'-0"	31'-0"	56'-0"
150ft	146	146'-0"	147	60'-0"	33'-0"	60'-0"

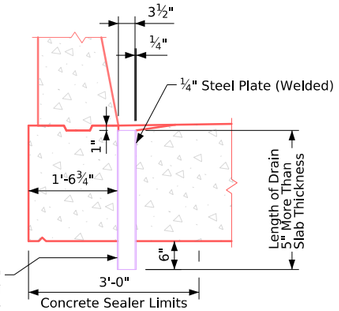


Note: 4" x 8" Outside dimension rolled tube with 1/4" wall thickness may be substituted for the welded drain shown.

Floor Drain Location



Part Plan



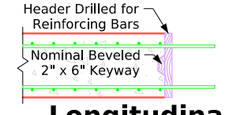
Section A-A

Floor Drain Details

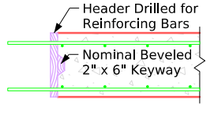
(Use for single slope barrier rail only, not required for open rail.)
Note: Drains are to be galvanized. Include the cost of drains in the price bid for "Structural Concrete Bridge."
(4 Drains Required)

Weight of One Floor Drain

Span	Weight, lbs.	Span	Weight, lbs.
70'-0"	32	120'-0"	41
80'-0"	33	130'-0"	43
90'-0"	35	140'-0"	45
100'-0"	37	150'-0"	48
110'-0"	39		



Longitudinal Construction Joint



Transverse Construction Joint

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

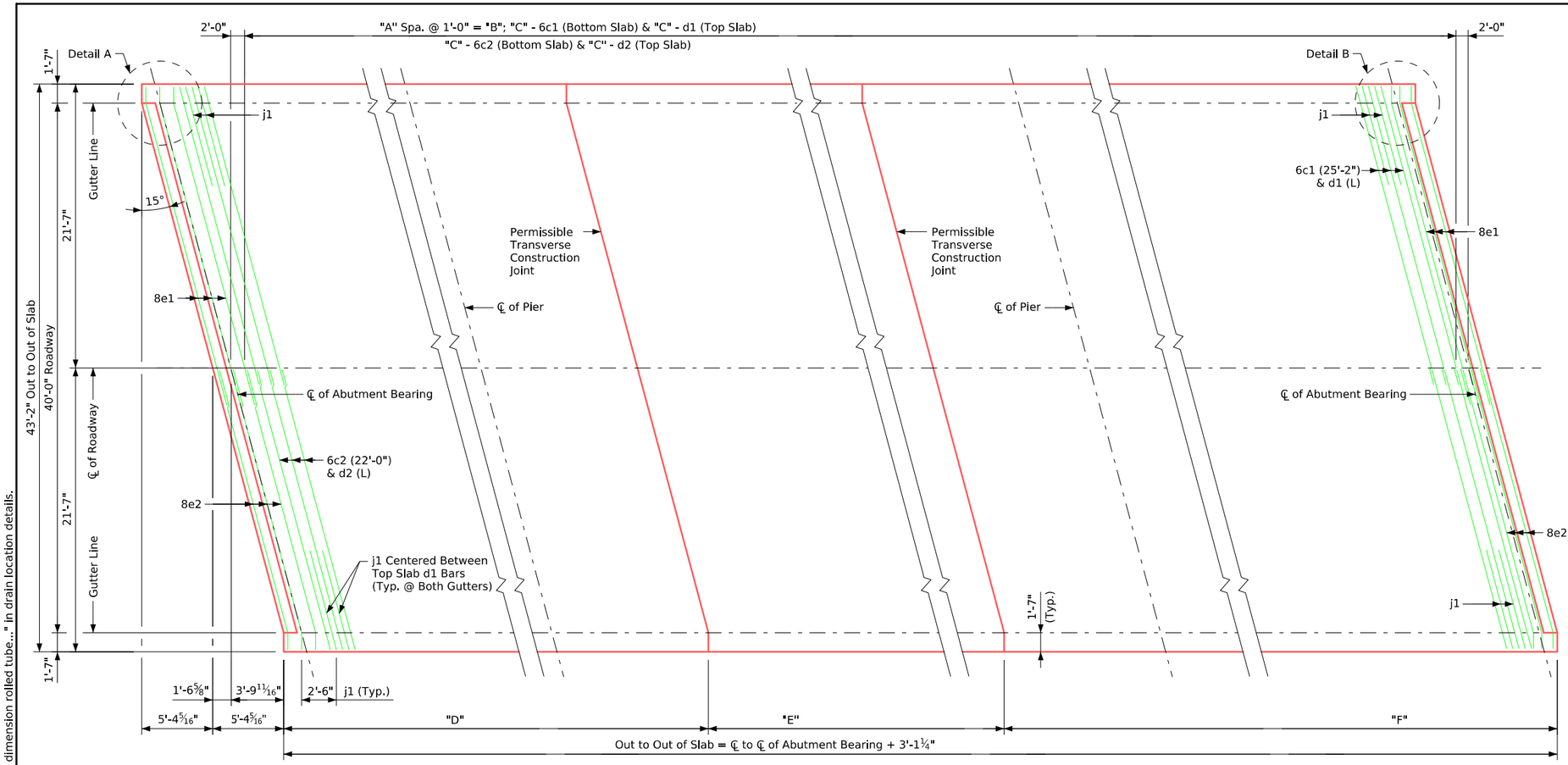
Continuous Concrete Slab Bridge

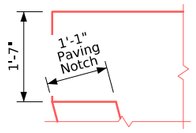
July, 2025

Superstructure Details
0° Skew

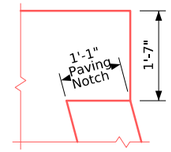
J40-21-25

Revised 09-2026: Updated Bridge Engineer signature.



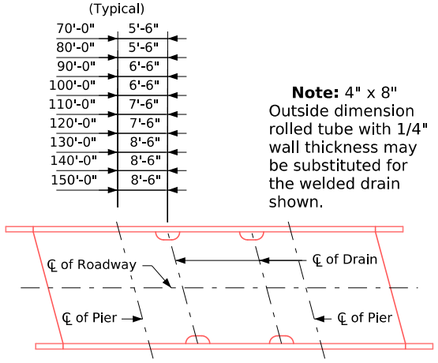


Detail A



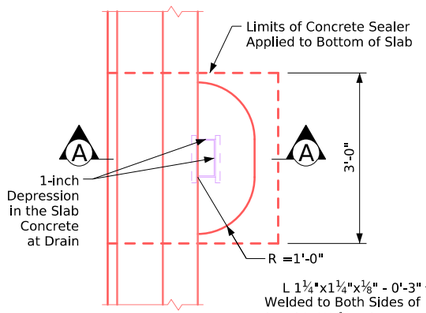
Detail B

15° Skew Transverse Reinforcing Steel Layout

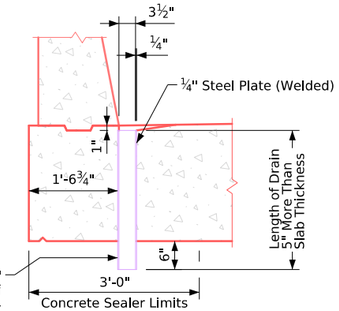


Floor Drain Location

Note: 4" x 8" Outside dimension rolled tube with 1/4" wall thickness may be substituted for the welded drain shown.



Part Plan



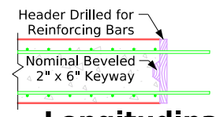
Section A-A

Floor Drain Details

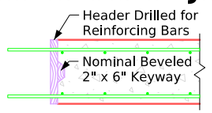
(Use for single slope barrier rail only, not required for open rail.)
Note: Drains are to be galvanized. Include the cost of drains in theprice bid for "**Structural Concrete Bridge.**"
(4 Drains Required)

Weight of One Floor Drain

Span	Weight, lbs.	Span	Weight, lbs.
70'-0"	32	120'-0"	41
80'-0"	33	130'-0"	43
90'-0"	35	140'-0"	45
100'-0"	37	150'-0"	48
110'-0"	39		



Longitudinal Construction Joint



Transverse Construction Joint

j1 Bar Size Table

Bridge Length	Bar Size
70' to 90'	7
100' to 110'	6
120' to 150'	5

d Bar Size & Length Table

Bridge Length	Bar Size	d1 (L)	d2 (L)
70'	6	26'-8"	22'-8"
80' to 150'	5	26'-1"	22'-7"

15° Transverse Reinforcement Dimensions – Table

Bridge	"A"	"B"	"C"	"D"	"E"	"F"
70ft	66	66'-0"	67	28'-0⅝"	17'-0"	28'-0⅝"
80ft	76	76'-0"	77	32'-0⅝"	19'-0"	32'-0⅝"
90ft	86	86'-0"	87	36'-0⅝"	21'-0"	36'-0⅝"
100ft	96	96'-0"	97	40'-0⅝"	23'-0"	40'-0⅝"
110ft	106	106'-0"	107	44'-0⅝"	25'-0"	44'-0⅝"
120ft	116	116'-0"	117	48'-0⅝"	27'-0"	48'-0⅝"
130ft	126	126'-0"	127	52'-0⅝"	29'-0"	52'-0⅝"
140ft	136	136'-0"	137	56'-0⅝"	31'-0"	56'-0⅝"
150ft	146	146'-0"	147	60'-0⅝"	33'-0"	60'-0⅝"

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

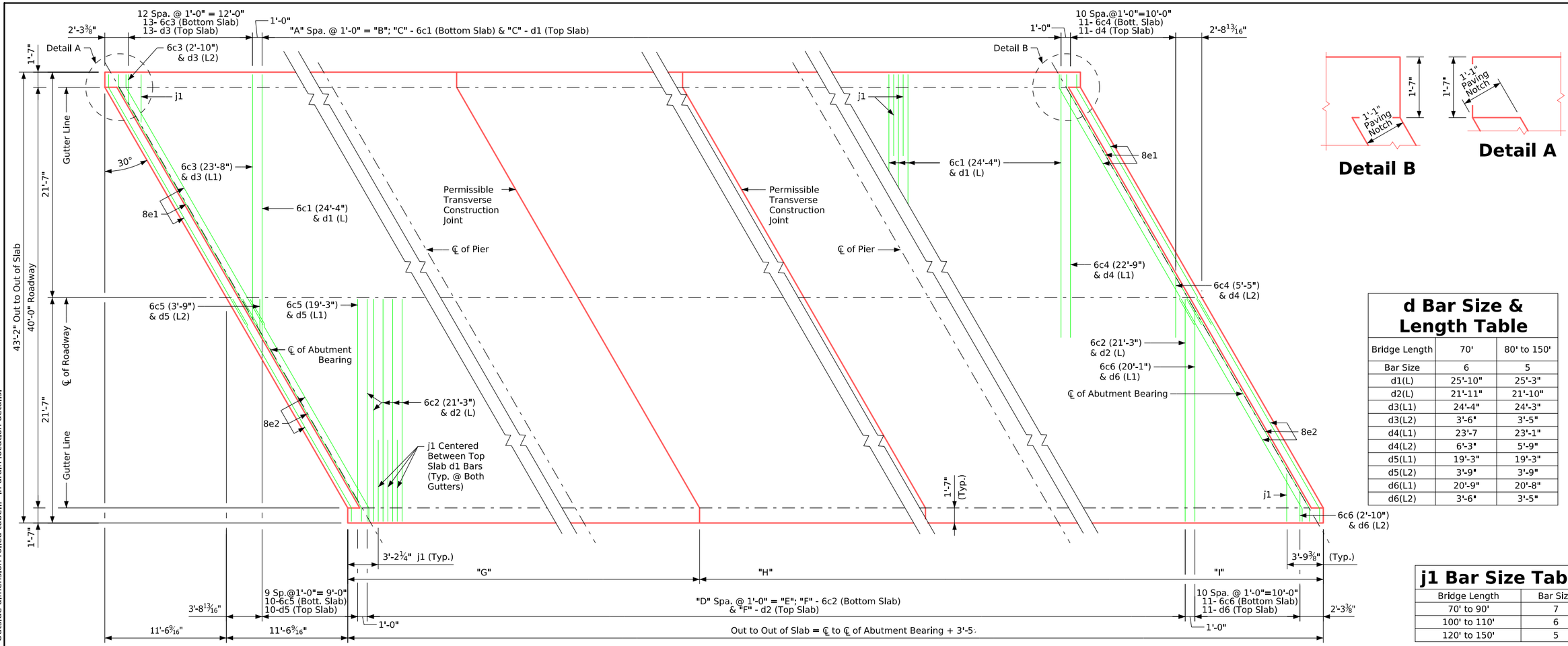
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
15° Skew

J40-22-25

Revised 09-2026: Updated Bridge Engineer signature. Added missing note regarding "4" x 8" Outside dimension rolled tube..." in drain location details.



d Bar Size & Length Table

Bridge Length	70'	80' to 150'
Bar Size	6	5
d1(L)	25'-10"	25'-3"
d2(L)	21'-11"	21'-10"
d3(L1)	24'-4"	24'-3"
d3(L2)	3'-6"	3'-5"
d4(L1)	23'-7	23'-1"
d4(L2)	6'-3"	5'-9"
d5(L1)	19'-3"	19'-3"
d5(L2)	3'-9"	3'-9"
d6(L1)	20'-9"	20'-8"
d6(L2)	3'-6"	3'-5"

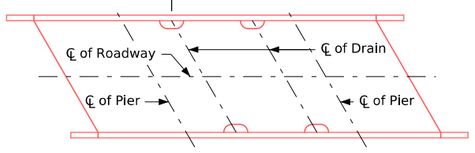
j1 Bar Size Table

Bridge Length	Bar Size
70' to 90'	7
100' to 110'	6
120' to 150'	5

(Typical)

70'-0"	5'-6"
80'-0"	5'-6"
90'-0"	6'-6"
100'-0"	6'-6"
110'-0"	7'-6"
120'-0"	7'-6"
130'-0"	8'-6"
140'-0"	8'-6"
150'-0"	8'-6"

Note: 4" x 8" Outside dimension rolled tube with 1/4" wall thickness may be substituted for the welded drain shown.

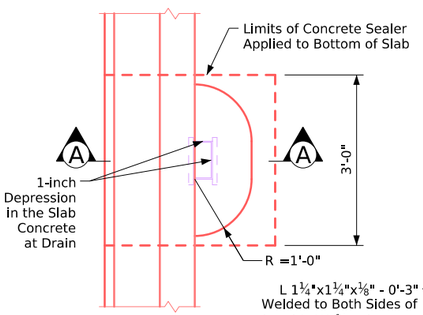


Floor Drain Location

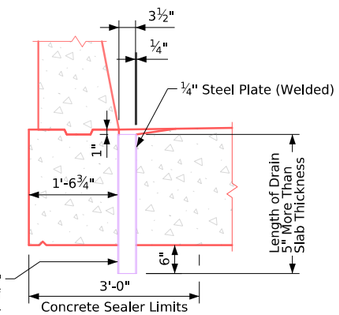
Weight of One Floor Drain

Span	Weight, lbs.	Span	Weight, lbs.
70'-0"	32	120'-0"	41
80'-0"	33	130'-0"	43
90'-0"	35	140'-0"	45
100'-0"	37	150'-0"	48
110'-0"	39		

30° Skew Transverse Reinforcing Steel Layout



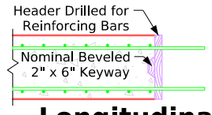
Part Plan



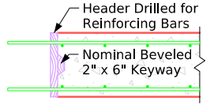
Section A-D

Floor Drain Details

(Use for single slope barrier rail only, not required for open rail.)
Note: Drains are to be galvanized. Include the cost of drains in theprice bid for "**Structural Concrete Bridge.**"
(4 Drains Required)



Longitudinal Construction Joint



Transverse Construction Joint

30° Transv. Reinf. Dim. Table

Bridge	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"
70ft	56	56'-0"	57	58	58'-0"	59	27'-8½"	17'-0"	28'-9"
80ft	66	66'-0"	67	68	68'-0"	69	31'-8½"	19'-0"	32'-9"
90ft	76	76'-0"	77	78	78'-0"	79	35'-8½"	21'-0"	36'-9"
100ft	86	86'-0"	87	88	88'-0"	89	39'-8½"	23'-0"	40'-9"
110ft	96	96'-0"	97	98	98'-0"	99	43'-8½"	25'-0"	48'-9"
120ft	106	106'-0"	107	108	108'-0"	109	47'-8½"	27'-0"	49'-0"
130ft	116	116'-0"	117	118	118'-0"	119	51'-8½"	29'-0"	52'-9"
140ft	126	126'-0"	127	128	128'-0"	129	55'-8½"	31'-0"	56'-9"
150ft	136	136'-0"	137	138	138'-0"	139	59'-8½"	33'-0"	60'-9"

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

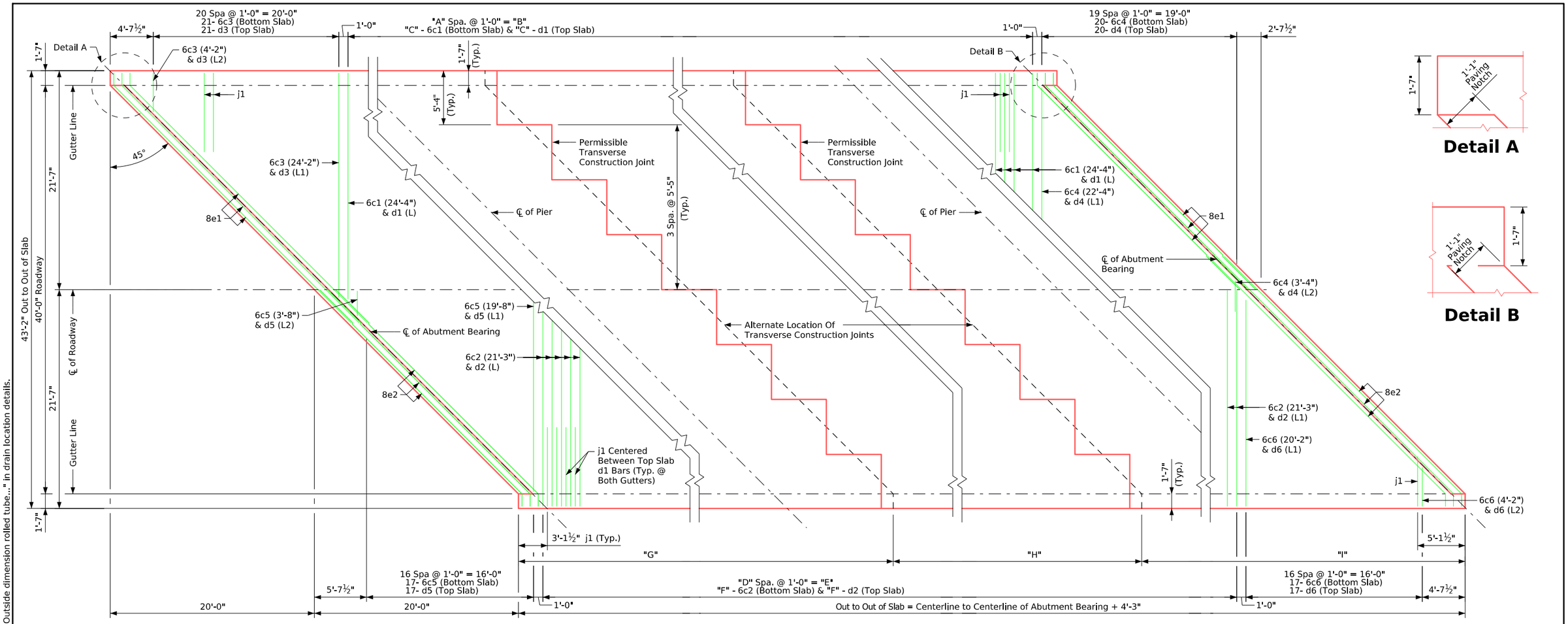
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
30° Skew

J40-23-25

Revised 09-2026: Updated Bridge Engineer signature. Added missing note regarding "4" x 8" Outside dimension rolled tube..." in drain location details.

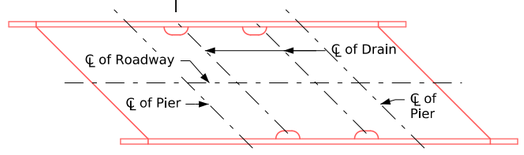


Revised 09-2026: Updated Bridge Engineer signature. Added missing note regarding "4" x 8" Outside dimension rolled tube..." in drain location details.

(Typical)

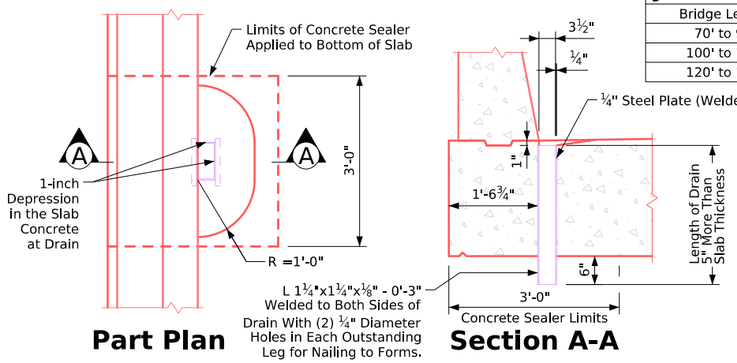
70'-0"	5'-6"
80'-0"	5'-6"
90'-0"	6'-6"
100'-0"	6'-6"
110'-0"	7'-6"
120'-0"	7'-6"
130'-0"	8'-6"
140'-0"	8'-6"
150'-0"	8'-6"

Note: 4" x 8" Outside dimension rolled tube with 1/4" wall thickness may be substituted for the welded drain shown.



Floor Drain Location

45° Skew Transverse Reinforcing Steel Layout



Part Plan

Section A-A

j1 Bar Size Table

Bridge Length	Bar Size
70' to 90'	7
100' to 110'	6
120' to 150'	5

45° Transv. Reinf. Dim. Table

Bridge	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"
70ft	46	46'-0"	47	50	50'-0"	51	27'-7"	17'-0"	29'-8"
80ft	56	56'-0"	57	60	60'-0"	61	31'-7"	19'-0"	33'-8"
90ft	66	66'-0"	67	70	70'-0"	71	35'-7"	21'-0"	37'-8"
100ft	76	76'-0"	77	80	80'-0"	81	39'-7"	23'-0"	41'-8"
110ft	86	86'-0"	87	90	90'-0"	91	43'-7"	25'-0"	45'-8"
120ft	96	96'-0"	97	100	100'-0"	101	47'-7"	27'-0"	49'-8"
130ft	106	106'-0"	107	110	110'-0"	111	51'-7"	29'-0"	53'-8"
140ft	116	116'-0"	117	120	120'-0"	121	55'-7"	31'-0"	57'-8"
150ft	126	126'-0"	127	130	130'-0"	131	59'-7"	33'-0"	61'-8"

d Bar Size & Length Table

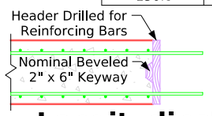
Bridge Length	70'	80' to 150'
Bar Size	6	5
d1(L)	25'-10"	25'-3"
d2(L)	21'-11"	21'-10"
d3(L1)	24'-10"	24'-9"
d3(L2)	4'-10"	4'-9"
d4(L1)	23'-2"	22'-8"
d4(L2)	4'-2"	3'-8"
d5(L1)	19'-8"	19'-8"
d5(L2)	3'-8"	3'-8"
d6(L1)	20'-10"	20'-9"
d6(L2)	4'-10"	4'-9"

Weight of One Floor Drain

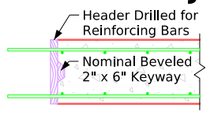
Span	Weight, lbs.	Span	Weight, lbs.
70'-0"	32	120'-0"	41
80'-0"	33	130'-0"	43
90'-0"	35	140'-0"	45
100'-0"	37	150'-0"	48
110'-0"	39		

Floor Drain Details

(Use for single slope barrier rail only, not required for open rail.)
Note: Drains are to be galvanized. Include the cost of drains in the price bid for **"Structural Concrete Bridge."**
(4 Drains Required)



Longitudinal Construction Joint



Transverse Construction Joint

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

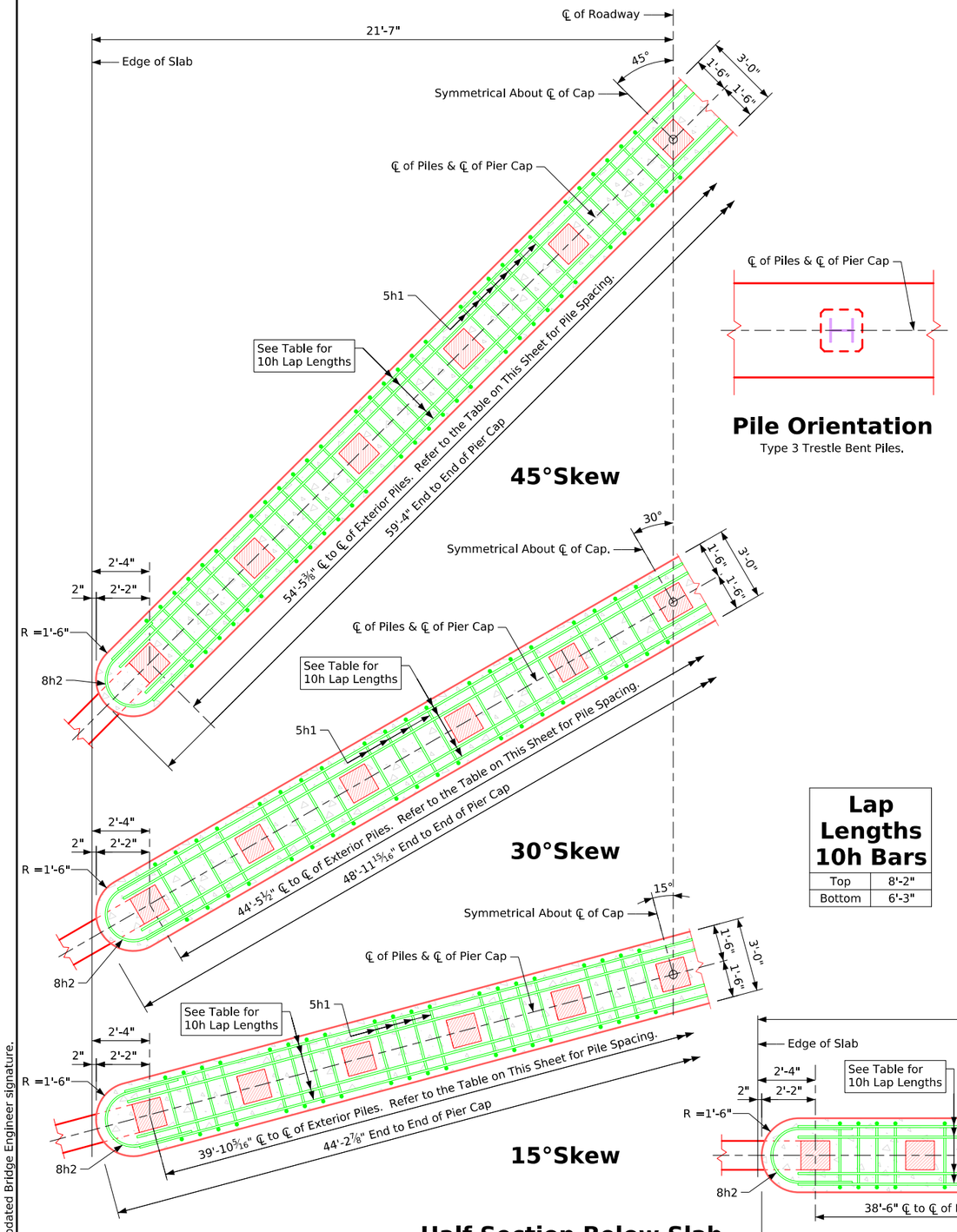
Continuous Concrete Slab Bridge

July, 2025

Superstructure Details
45° Skew

J40-24-25

5:14:51 PM 9/4/2026 bkloss pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\J40-25.dgn

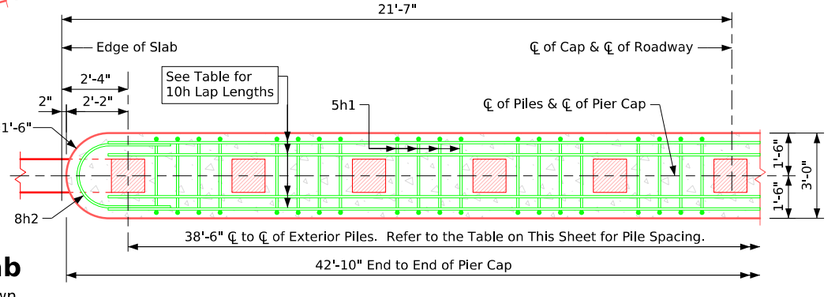


Pile Orientation

Type 3 Trestle Bent Piles.

Lap Lengths 10h Bars

Top	8'-2"
Bottom	6'-3"



Half Section Below Slab

Note: The number of piles and stirrups shown are for a 100'-0" bridge w/ HP 10x42 piles. Cap dimensions are typical for all bridges.

*Factored Loads And Number Of Piles Monolithic - 40' Roadway

Bridge Length	HP 10 x 42					HP 10 x 57					HP 12 x 53					HP 14 x 73					HP 14 x 89				
	Pu (kips)	Number of Piles				Pu (kips)	Number of Piles				Pu (kips)	Number of Piles				Pu (kips)	Number of Piles				Pu (kips)	Number of Piles			
		0°	15°	30°	45°		0°	15°	30°	45°		0°	15°	30°	45°		0°	15°	30°	45°		0°	15°	30°	45°
70'-0	856	8	8	8	8	855	6	6	7	8	881	7	7	7	8	928	6	6	7	8	927	6	6	7	8
80'-0	950	9	9	9	9	942	7	7	7	8	968	8	8	8	8	1014	6	6	7	8	1014	6	6	7	8
90'-0	1055	10	10	10	10	1040	8	8	8	8	1066	8	8	8	8	1113	6	6	7	8	1112	6	6	7	8
100'-0	1170	11	11	11	11	1148	8	8	8	8	1184	9	9	9	9	1220	7	7	7	8	1219	6	6	7	8
110'-0	1282	12	12	12	12	1259	9	9	9	9	1299	10	10	10	10	1325	8	8	8	8	1324	6	6	7	8
120'-0	1420	14	14	14	14	1391	10	10	10	10	1433	11	11	11	11	1449	8	8	8	8	1449	7	7	7	8
130'-0	1550	15	15	15	15	1521	11	11	11	11	1567	12	12	12	12	1588	9	9	9	9	1571	7	7	7	8
140'-0	1686	16	16	16	16	1656	12	12	12	12	1705	13	13	13	13	1733	10	10	10	10	1700	8	8	8	8
150'-0	1844	N.A	N.A	17	18	1807	13	13	13	13	1859	14	14	14	14	1893	11	11	11	11	1860	9	9	9	9

*Factored Loads And Number Of Piles Monolithic - 40' Roadway

Bridge Length	Prestressed 14"					Prestressed 16"					Cast In Place 14"					Cast In Place 16"				
	Pu (kips)	Number of Piles				Pu (kips)	Number of Piles				Pu (kips)	Number of Piles				Pu (kips)	Number of Piles			
		0°	15°	30°	45°		0°	15°	30°	45°		0°	15°	30°	45°		0°	15°	30°	45°
70'-0	901	10	10	10	10	919	9	9	9	9	891	10	10	10	10	906	9	9	9	9
80'-0	998	11	11	11	11	1019	10	10	10	10	987	11	11	11	11	1005	9	9	10	10
90'-0	1107	12	12	12	12	1130	11	11	11	11	1095	12	12	12	12	1115	10	10	11	11
100'-0	1224	13	13	13	13	1251	12	12	12	12	1212	13	13	13	13	1235	12	12	12	12
110'-0	1349	14	14	14	15	1369	N.A	N.A	13	13	1325	14	14	14	14	1351	N.A	N.A	13	13
120'-0	1484	N.A	N.A	16	16	1507	N.A	N.A	14	14	1468	N.A	N.A	16	16	1488	N.A	N.A	14	14
130'-0	1617	N.A	N.A	N.A	17	1656	N.A	N.A	N.A	16	1601	N.A	N.A	N.A	17	1622	N.A	N.A	N.A	15
140'-0	1766	N.A	N.A	N.A	19	1798	N.A	N.A	N.A	17	1747	N.A	N.A	N.A	19	1775	N.A	N.A	N.A	17
150'-0	1930	N.A	N.A	N.A	N.A	1955	N.A	N.A	N.A	N.A	1900	N.A	N.A	N.A	N.A	1930	N.A	N.A	N.A	N.A

N.A. indicates the pile spacing for this pile size does not satisfy the maximum or minimum spacing requirements.

*Pu is Strength 1 Pier Design load which includes factored dead and live loads including dynamic load allowance (IM) pier cap weight based on 45° skew, and weight of pile encasement.

Pile Spacing - Monolithic - 40' Roadway Width

No. Piles	No. Spaces	0° Skew	15° Skew	30° Skew	45° Skew
6	5	7'-8"	8'-0"	N.A.	N.A.
7	6	6'-5"	6'-8"	7'-5"	N.A.
8	7	5'-6"	5'-8"	6'-4"	7'-9"
9	8	4'-10"	5'-0"	5'-7"	6'-10"
10	9	4'-3"	4'-5"	4'-11"	6'-1"
11	10	3'-10"	4'-0"	4'-5"	5'-5"
12	11	3'-6"	3'-7"	4'-0"	4'-11"
13	12	3'-2"	3'-4"	3'-8"	4'-6"
14	13	3'-0"	3'-1"	3'-5"	4'-2"
15	14	2'-9"	2'-10"	3'-2"	3'-11"
16	15	2'-7"	2'-8"	3'-0"	3'-8"
17	16	N.A.	N.A.	2'-9"	3'-5"
18	17	N.A.	N.A.	2'-7"	3'-2"
19	18	N.A.	N.A.	N.A.	3'-0"

N.A. indicates the pile spacing for this pile size cannot satisfy for the limits of the maximum or minimum spacing requirements.

Pier Notes:

The minimum clear distance from the face of the concrete to the nearest reinforcing bar is to be 2" unless otherwise noted or shown.

Pier piles are to be driven to full penetration, if practicable, but in no case to a bearing value less than the pile bearing required for each bridge length as shown in plans. Additional driving capacity may be required through scourable layers. For General Plan Notes for additional information, Sheet **J40-01-25**.

Cap steel, as detailed on the P10L Standard Pile Drawing, is required for monolithic pier caps.

Concrete quantities are based on the use of Type 3 piling. If Type 1 or Type 2 is used, concrete quantities may be adjusted to account for the concrete displaced by the piling.

All reinforcing steel is to be Grade 60.

Pier piling was designed for HL-93 loading with an allowance for 20 lbs. per sq. ft. of future wearing surface.

Note:
For Monolithic Pier Cap Details And Quantities, See Sheet **J40-26-25**.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

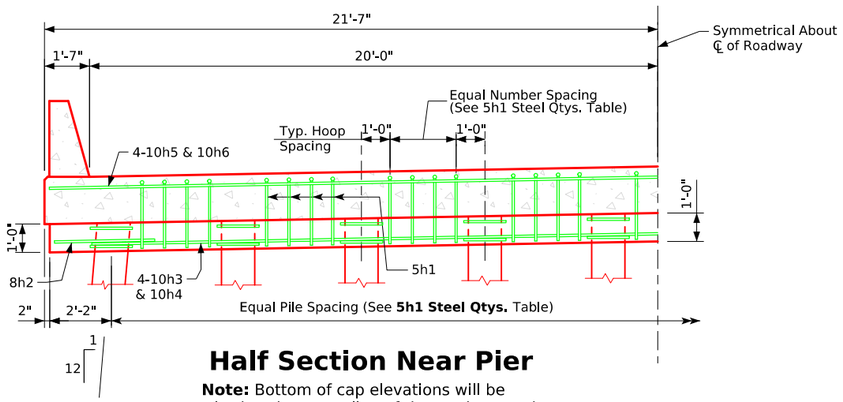
Continuous Concrete Slab Bridge

July, 2025

Pier Cap Monolithic
Details All Bridges (1 of 2)

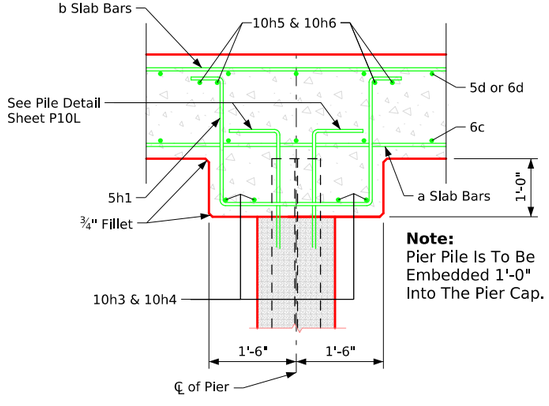
J40-25-25

Revised 09-2026: Updated Bridge Engineer signature.



Half Section Near Pier

Note: Bottom of cap elevations will be required at the centerline of the roadway and at each exterior pile.



Note:
Pier Pile Is To Be Embedded 1'-0" Into The Pier Cap.

TYPICAL CAP SECTION

Note:
* Total weight shall be calculated by the Designer based on the type/size of piling used and the size of the bridge.

5h1 Steel Quantities - Monolithic Pier Cap - One Pier 40' Roadway Width

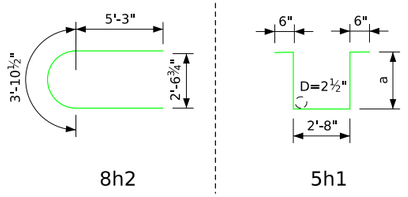
No. Piles	No. Pile Spaces	5h1 Shape	5h1 Length (ft)	0° Skew		15° Skew		30° Skew		45° Skew	
				No. Eq. Hoop Spaces	Total No. Hoops	No. Eq. Hoop Spaces	Total No. Hoops	No. Eq. Hoop Spaces	Total No. Hoops	No. Eq. Hoop Spaces	Total No. Hoops
7	6		See 5h1 Bar Lengths Table	5	36	5	36	6	42	N.A	N.A
8	7			4	35	4	35	5	42	6	49
9	8			3	32	3	32	4	40	5	48
10	9			3	36	3	36	3	36	5	54
11	10			2	30	2	30	3	40	4	50
12	11			2	33	2	33	3	44	3	44
13	12			2	36	2	36	2	36	3	48
14	13			1	26	2	39	2	39	3	52
15	14			1	28	1	28	2	42	2	42
16	15			1	30	1	30	1	30	2	45
17	16			N.A	N.A	N.A	N.A	1	32	2	48
18	17			N.A	N.A	N.A	N.A	1	34	2	51
19	18			N.A	N.A	N.A	N.A	1	36	2	52

Epoxy Reinforcing Steel - Monolithic 40' Roadway - One Pier

Epoxy Reinforcing Steel - Monolithic - 40' Roadway - One Pier

Bar	Shape	0° Skew No.	0° Skew Length	0° Skew Weight	15° Skew No.	15° Skew Length	15° Skew Weight	30° Skew No.	30° Skew Length	30° Skew Weight	45° Skew Length	45° Skew No.	45° Skew Weight
8h2		2	14'-5"	77	2	14'-5"	77	2	14'-5"	77	14'-5"	2	77
10h3		4	19'-11"	343	4	20'-7"	354	4	23'-0"	396	28'-2"	4	485
10h4		4	26'-2"	450	4	26'-10"	462	4	29'-3"	503	34'-2"	4	588
10h5		4	21'-5"	369	4	21'-10"	376	4	23'-11"	412	28'-8"	4	493
10h6		4	29'-7"	509	4	30'-0"	516	4	32'-1"	552	36'-10"	4	634

Bent Bar Details



Note: All dimensions are out-to-out. D = Pin diameter.

5h1 bar Lengths

Bridge Length	a Dimension	Length	Wt/bar (lbs)
70'-0"	1'-7½"	6'-11"	7
80'-0"	1'-8¾"	7'-1"	7
90'-0"	1'-9¾"	7'-3"	8
100'-0"	1'-10¾"	7'-5"	8
110'-0"	2'-0¾"	7'-9"	8
120'-0"	2'-1"	7'-10"	8
130'-0"	2'-2¾"	8'-1"	8
140'-0"	2'-3½"	8'-3"	9
150'-0"	2'-5"	8'-6'	9

Note:
For Pile Spacing, See Sheet **J40-25-25**.

Est. Concrete Qty - Monolithic One Pier 40' Roadway Width

Skew		70'-0"	80'-0"	90'-0"	100'-0"	110'-0"	120'-0"	130'-0"	140'-0"	150'-0"
Structural Concrete (Cu. Yds.)	0°	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
	15°	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
	30°	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
	45°	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

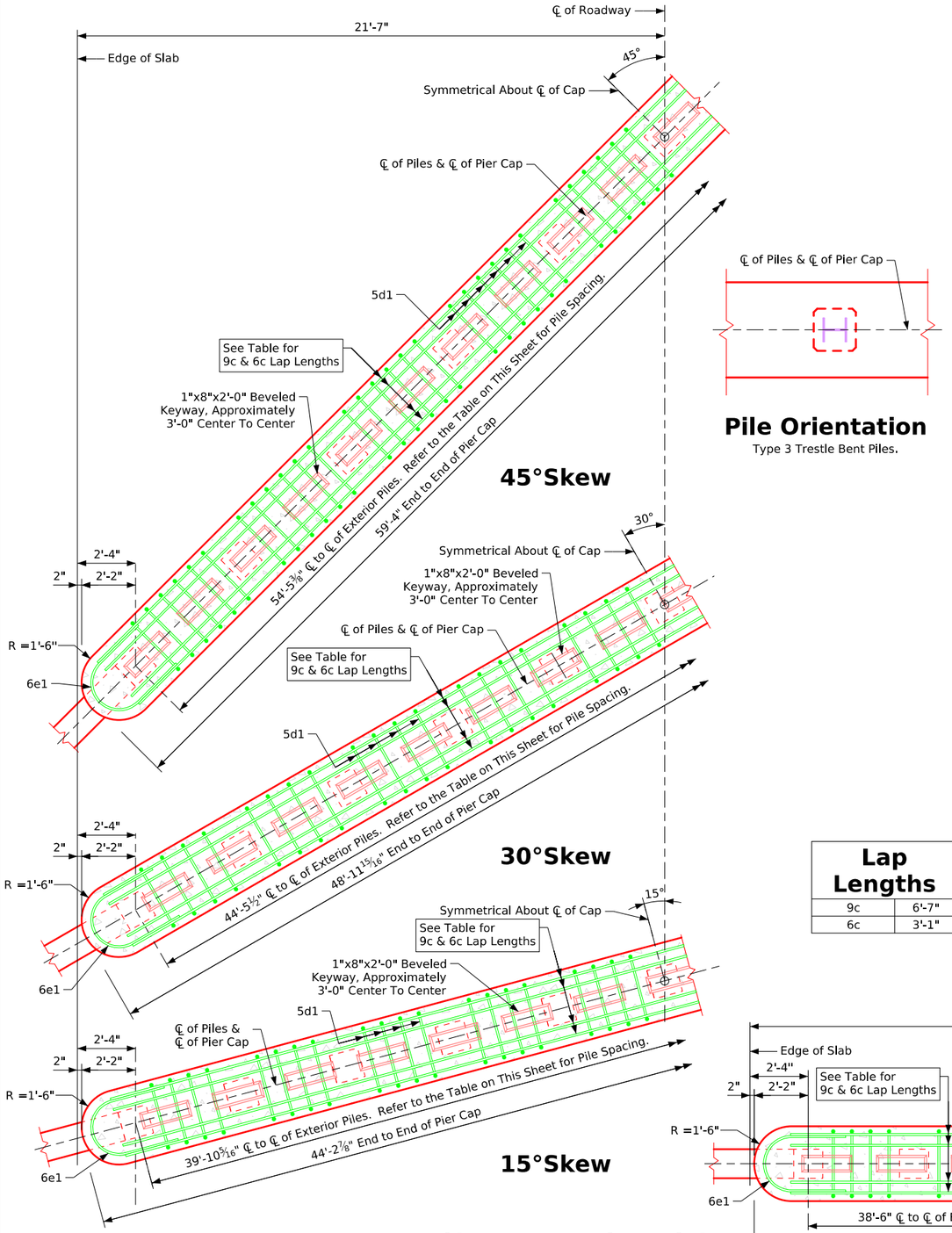
Continuous Concrete Slab Bridge

July, 2025

Pier Cap Monolithic Details All Bridges (2 of 2)

J40-26-25

Revised 09-2026: Updated Bridge Engineer signature.

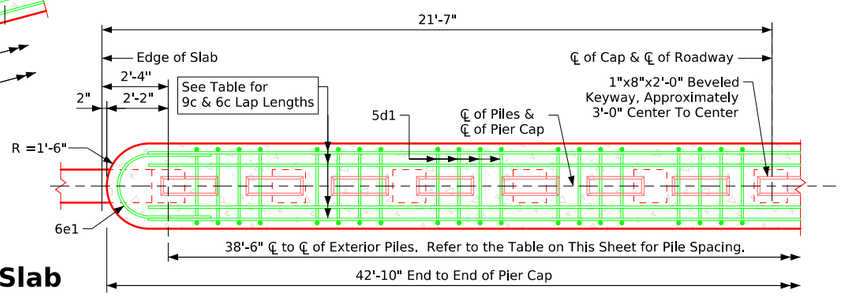


Pile Orientation

Type 3 Trestle Bent Piles.

Lap Lengths

9c	6'-7"
6c	3'-1"



0°Skew

Half Section Below Slab

Note: The number of piles and stirrups shown are for a 100'-0" bridge w/ HP 10x42 piles. Cap dimensions are typical for all bridges.

*Factored Loads And Number Of Piles - Non-Monolithic 40' Roadway

Bridge Length	HP 10 x 42 Pu (kips)	HP 10 x 42 Number of Piles 0°	15°	30°	45°	HP 10 x 57 Pu (kips)	HP 10 x 57 Number of Piles 0°	15°	30°	45°	HP 12 x 53 Pu (kips)	HP 12 x 53 Number of Piles 0°	15°	30°	45°	HP 14 x 73 Pu (kips)	HP 14 x 73 Number of Piles 0°	15°	30°	45°	HP 14 x 89 Pu (kips)	HP 14 x 89 Number of Piles 0°	15°	30°	45°
70'-0	941	9	9	9	9	934	7	7	7	8	959	7	7	7	8	1006	6	6	7	8	1005	6	6	7	8
80'-0	1035	10	10	10	10	1020	7	7	7	8	1046	8	8	8	8	1093	6	6	7	8	1092	6	6	7	8
90'-0	1141	11	11	11	11	1119	8	8	8	8	1155	9	9	9	9	1191	7	7	7	8	1191	6	6	7	8
100'-0	1255	12	12	12	12	1233	9	9	9	9	1273	10	10	10	10	1299	7	7	7	8	1298	6	6	7	8
110'-0	1367	13	13	13	13	1345	9	9	10	10	1387	11	11	11	11	1403	8	8	8	8	1403	6	6	7	8
120'-0	1499	14	14	14	14	1476	10	10	10	11	1522	12	12	12	12	1544	9	9	9	9	1527	7	7	7	8
130'-0	1636	15	15	15	16	1599	11	11	11	11	1655	13	13	13	13	1667	9	9	9	9	1650	8	8	8	8
140'-0	1771	N.A	N.A	17	17	1735	12	12	12	12	1794	14	14	14	14	1811	10	10	10	10	1778	8	8	8	8
150'-0	1922	N.A	N.A	18	18	1885	13	13	13	13	1948	15	15	15	15	1971	11	11	11	11	1938	9	9	9	9

*Factored Loads And Number Of Piles - Non-Monolithic 40' Roadway

Bridge Length	Prestressed 14" Pu (kips)	Prestressed 14" Number of Piles 0°	15°	30°	45°	Prestressed 16" Pu (kips)	Prestressed 16" Number of Piles 0°	15°	30°	45°	Cast In Place 14" Pu (kips)	Cast In Place 14" Number of Piles 0°	15°	30°	45°	Cast In Place 16" Pu (kips)	Cast In Place 16" Number of Piles 0°	15°	30°	45°
70'-0	990	10	10	11	11	1010	9	9	9	10	979	10	10	10	11	985	9	9	9	9
80'-0	1087	11	12	12	12	1110	10	10	10	11	1075	11	11	11	12	1083	10	10	10	10
90'-0	1195	13	13	13	13	1222	11	11	11	12	1183	12	13	13	13	1194	11	11	11	11
100'-0	1313	14	14	14	14	1343	12	12	12	13	1299	14	14	14	14	1313	12	12	12	12
110'-0	1428	N.A	N.A	15	15	1461	N.A	N.A	14	14	1413	N.A	N.A	15	15	1442	N.A	N.A	13	14
120'-0	1572	N.A	N.A	N.A	17	1598	N.A	N.A	N.A	15	1556	N.A	N.A	N.A	17	1578	N.A	N.A	N.A	15
130'-0	1706	N.A	N.A	N.A	18	1735	N.A	N.A	N.A	16	1688	N.A	N.A	N.A	18	1713	N.A	N.A	N.A	16
140'-0	1854	N.A	N.A	N.A	N.A	1890	N.A	N.A	N.A	N.A	1835	N.A	N.A	N.A	N.A	1853	N.A	N.A	N.A	17
150'-0	2018	N.A	N.A	N.A	N.A	2047	N.A	N.A	N.A	N.A	1988	N.A	N.A	N.A	N.A	2021	N.A	N.A	N.A	N.A

N.A. indicates the pile spacing for this pile size does not satisfy the maximum or minimum spacing requirements.

*Pu is Strength 1 Pier Design load which includes factored dead and live loads including dynamic load allowance (IM) pier cap weight based on 45° skew, and weight of pile encasement.

Pile Spacing - Monolithic - 40' Roadway Width

No. Piles	No. Spaces	0° Skew	15° Skew	30° Skew	45° Skew
6	5	7'-8"	8'-0"	N.A.	N.A.
7	6	6'-5"	6'-8"	7'-5"	N.A.
8	7	5'-6"	5'-8"	6'-4"	7'-9"
9	8	4'-10"	5'-0"	5'-7"	6'-10"
10	9	4'-3"	4'-5"	4'-11"	6'-1"
11	10	3'-10"	4'-0"	4'-5"	5'-5"
12	11	3'-6"	3'-7"	4'-0"	4'-11"
13	12	3'-2"	3'-4"	3'-8"	4'-6"
14	13	3'-0"	3'-1"	3'-5"	4'-2"
15	14	2'-9"	2'-10"	3'-2"	3'-11"
16	15	2'-7"	2'-8"	3'-0"	3'-8"
17	16	N.A.	N.A.	2'-9"	3'-5"
18	17	N.A.	N.A.	2'-7"	3'-2"
19	18	N.A.	N.A.	N.A.	3'-0"

N.A. indicates the pile spacing for this pile size cannot satisfy for the limits of the maximum or minimum spacing requirements.

Pier Notes:

For skewed bridges, the bottom of the pier cap is to be sloped to compensate for grade. Therefore, bottom-of-cap elevations will be required at the centerline of the roadway and at each exterior pile.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar is to be 2 inches unless otherwise noted or shown.

Pier piles are to be driven to full penetration if practicable but, in no case, to a bearing value less than the pile bearing required for each bridge.

Concrete quantities are based on the use of Type 3 piling. If Type 1 or Type 2 is used, concrete quantities may be adjusted to account for the displacement caused by the piling.

All reinforcing steel is to be Grade 60.

Pier piling was designed for HL-93 loading with an allowance for a 20 lbs. per sq. ft. future wearing surface.

Note:
For Non-Monolithic Pier Cap Details And Quantities, See Sheet **J40-28-25**.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

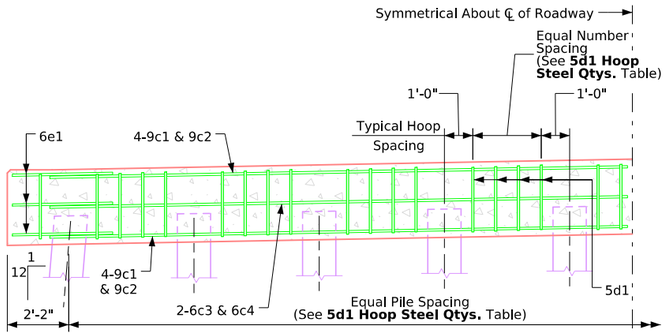
Continuous Concrete Slab Bridge

July, 2025

Pier Cap Non-Monolithic
Details All Bridges (1 of 2)

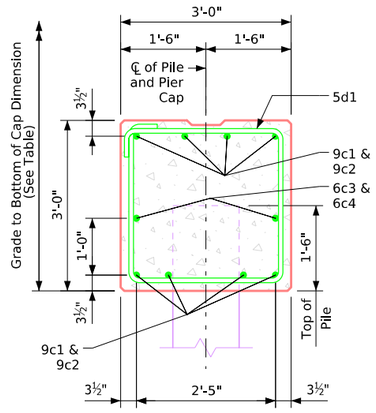
J40-27-25

Revised 09-2026: Updated Bridge Engineer signature.



Typ. Half Elevation Pier Cap

(Looking Parallel to ℄ Roadway)



Typical Section

5d1 Hoop Steel Quantities - Non-Monolithic Pier Cap One Pier - 40' Roadway Width

No. Piles	No. Pile Spaces	5d1 Hoop Shape	5d1 Hoop Length (ft)	0° Skew			15° Skew			30° Skew			45° Skew		
				No. Eq. Hoop Spaces	Total No. Hoops	Total Weight (lbs)	No. Eq. Hoop Spaces	Total No. Hoops	Total Weight (lbs)	No. Eq. Hoop Spaces	Total No. Hoops	Total Weight (lbs)	No. Eq. Hoop Spaces	Total No. Hoops	Total Weight (lbs)
7	6		11'-8"	5	36	438	5	36	438	6	42	511	N.A	N.A	N.A
8	7		11'-8"	4	35	426	4	35	426	5	42	511	6	49	596
9	8		11'-8"	3	32	389	3	32	389	4	40	487	5	48	584
10	9		11'-8"	3	36	438	3	36	438	3	36	438	5	54	657
11	10		11'-8"	2	30	365	2	30	365	3	40	487	4	50	609
12	11		11'-8"	2	33	402	2	33	402	3	44	536	3	44	536
13	12		11'-8"	2	36	438	2	36	438	2	36	438	3	48	584
14	13		11'-8"	1	26	316	2	39	475	2	39	475	3	52	633
15	14		11'-8"	1	28	341	1	28	341	2	42	511	2	42	511
16	15		11'-8"	1	30	365	1	30	365	1	30	365	2	45	548
17	16		11'-8"	N.A	N.A	N.A	N.A	N.A	N.A	1	32	389	2	48	584
18	17		11'-8"	N.A	N.A	N.A	N.A	N.A	N.A	1	34	414	2	51	621
19	18		11'-8"	N.A	N.A	N.A	N.A	N.A	N.A	1	36	439	2	52	633

Bridge Grade to Bottom of Cap Dimension

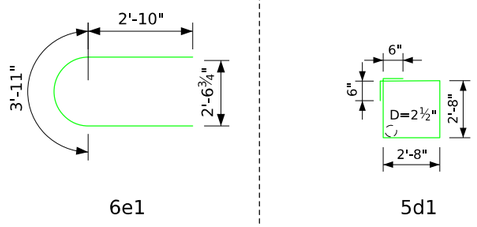
70'- Bridge	4'-9 3/16"
80'- Bridge	4'-9 15/16"
90'- Bridge	4'-10 15/16"
100'- Bridge	5'-0 3/16"
110'- Bridge	5'-1 3/16"
120'- Bridge	5'-2 11/16"
130'- Bridge	5'-3 15/16"
140'- Bridge	5'-5 3/16"
150'- Bridge	5'-6 11/16"

Epoxy Reinforcing Steel - Non-Monolithic 40' Roadway - One Pier

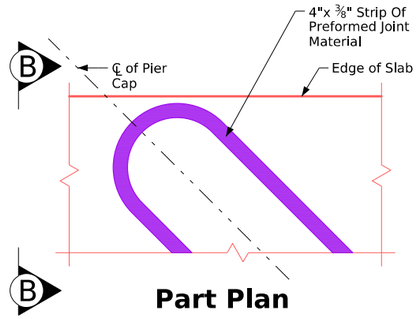
Epoxy Reinforcing Steel - Non-Monolithic - 40' Roadway - One Pier

Bar	Shape	0° Skew			15° Skew			30° Skew			45° Skew		
		No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
9c1		8	19'-11"	542	8	20'-7"	561	8	23'-0"	626	8	28'-2"	766
9c2		8	26'-7"	723	8	27'-3"	742	8	29'-8"	807	8	35'-0"	952
6c3		2	19'-11"	60	2	20'-7"	62	2	23'-0"	69	2	28'-2"	85
6c4		2	23'-2"	70	2	23'-10"	72	2	26'-4"	79	2	31'-6"	95
6e1		6	9'-7"	86	6	9'-7"	86	6	9'-7"	86	6	9'-7"	86

Bent Bar Details

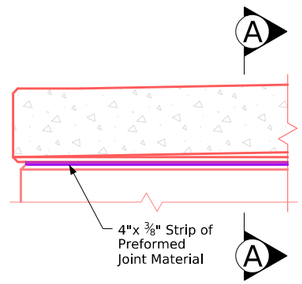


Note: All dimensions are out-to-out. D = Pin diameter.

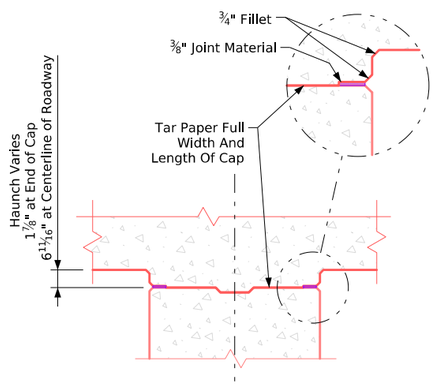


Part Plan

Showing treatment of 4" x ⅜" strip of preformed joint material at ends of pier cap. Note that joint material is to go all the way around pier cap for square and skewed bridges.



Part Section B-B



Part Section A-A

Note:
For Pile Spacing, See Sheet **J40-27-25**.

Est. Concrete Qty - Non-Monolithic One Pier 40' Roadway Width

Skew		70'-0"	80'-0"	90'-0"	100'-0"	110'-0"	120'-0"	130'-0"	140'-0"	150'-0"
Structural Concrete (Cu. Yds.)	0°	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1
	15°	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
	30°	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
	45°	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

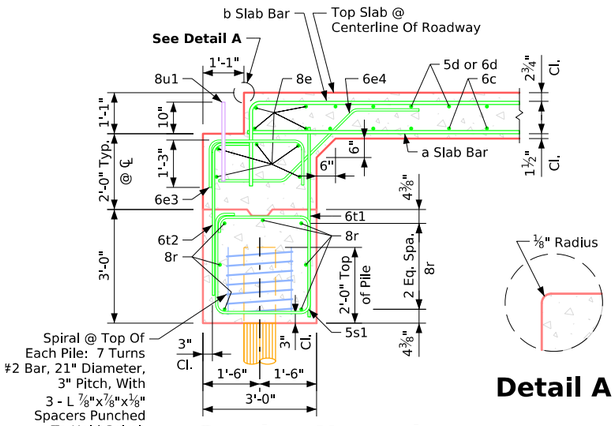
July, 2025

Pier Cap Non-Monolithic Details All Bridges (2 of 2)

J40-28-25

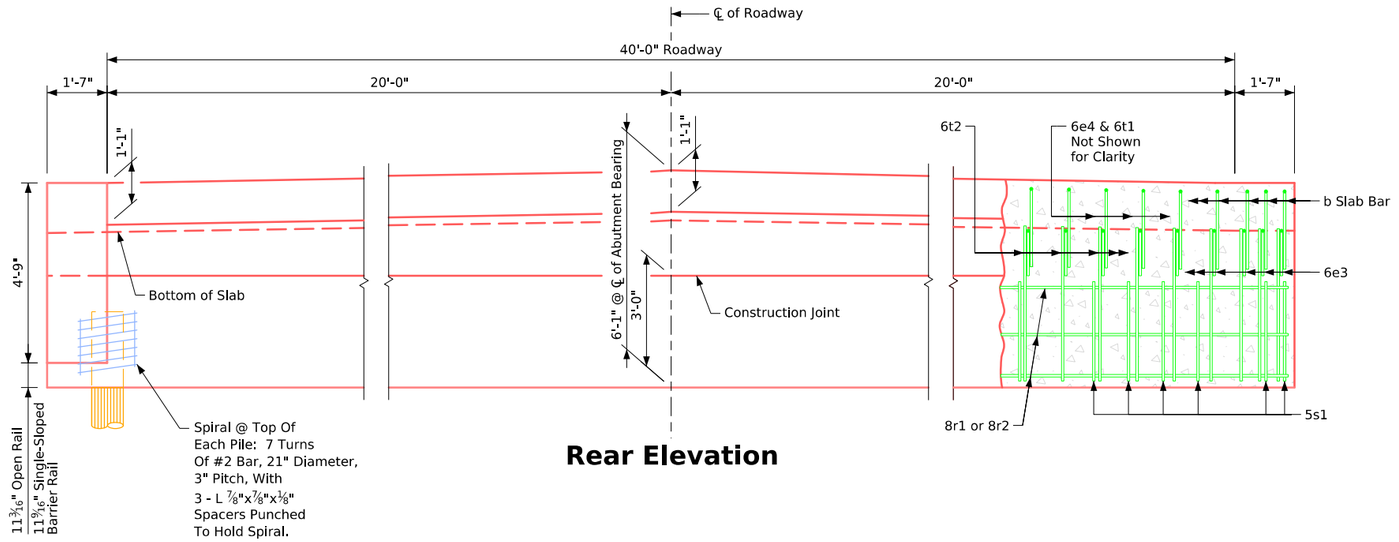
Revised 09-2026: Updated Bridge Engineer signature.

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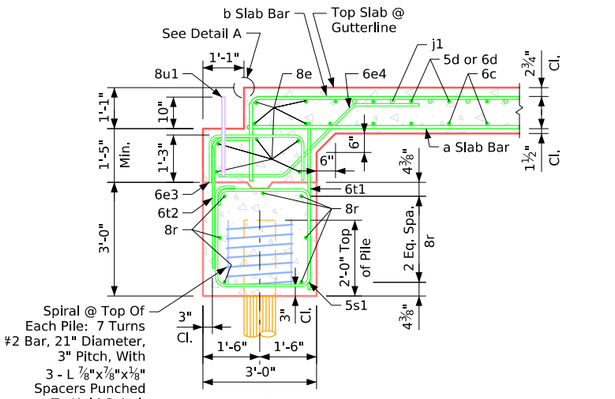


Section Normal to Abutment @ ℄

Detail A



Rear Elevation



Section Normal to Abutment @ Gutter Line

ABUTMENT NOTES:

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet apply only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar shall be 2 inches unless otherwise noted or shown.

Timber piles shall be driven to full penetration if practicable, but in no case to a bearing value less than specified in the design plans. Timber piles shall not be driven to more than 160 tons.

All reinforcing steel shall be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for a 20 lbs. per sq. ft. future wearing surface.

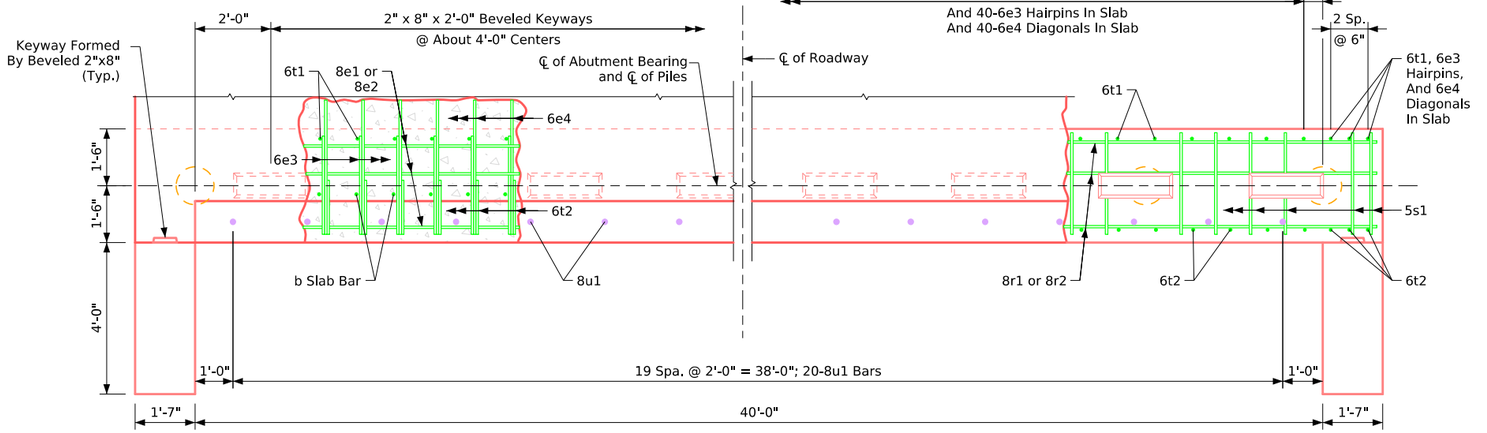
NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.



Plan View

09-2026
Latest Revision Date

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IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

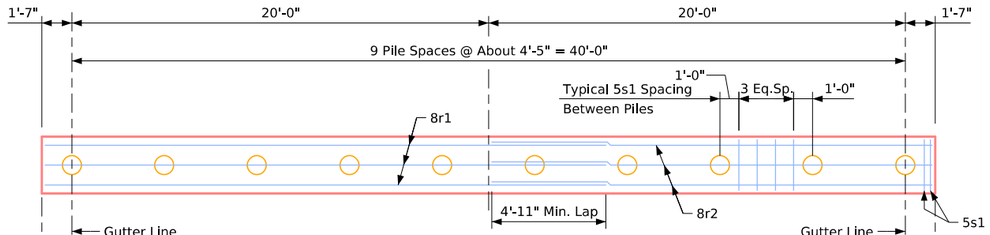
Continuous Concrete Slab Bridge

July, 2025

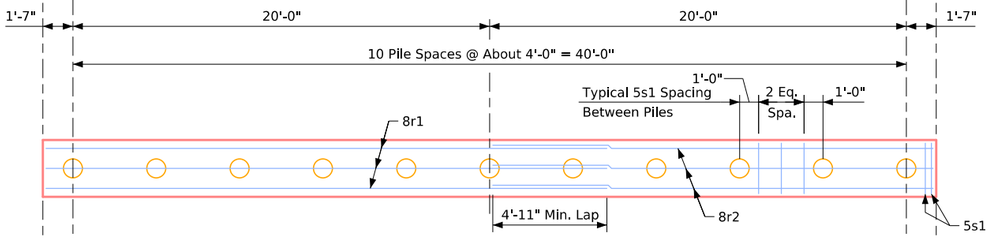
Abutment Details 0° Skew - Timber Piling (1 of 2)

J40-29-25

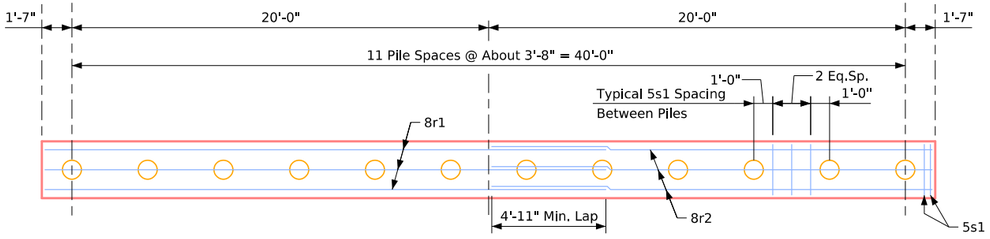
Revised 09-2026: Updated Bridge Engineer signature.



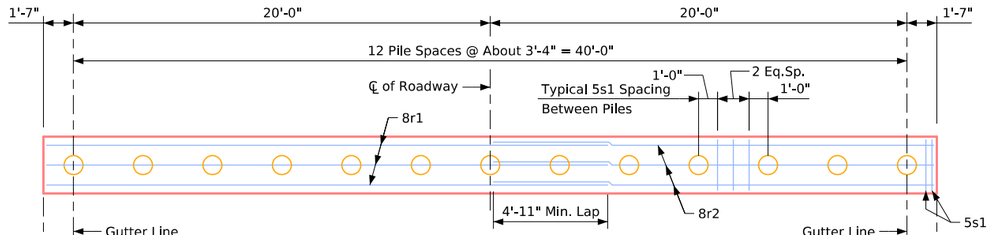
70'-0" & 80'-0" Bridges



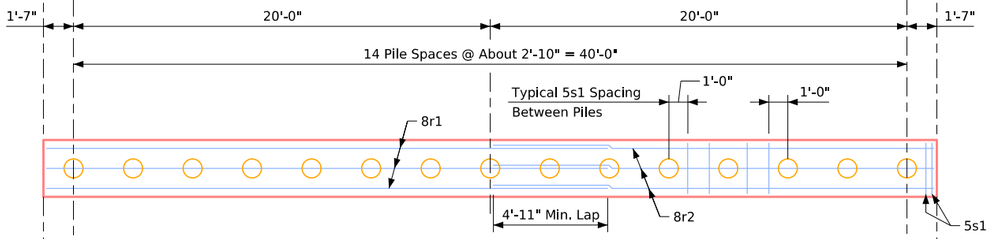
90'-0" & 100'-0" Bridges



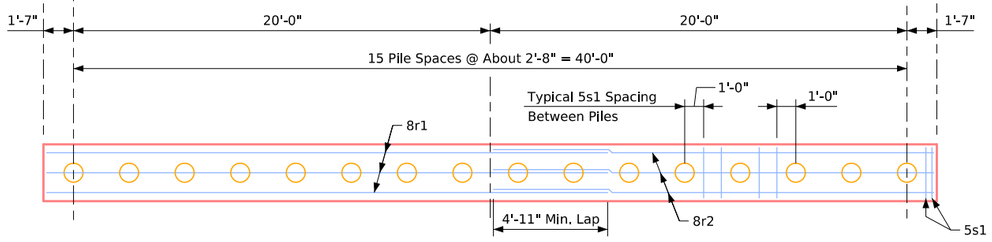
110'-0" Bridge



120'-0" & 130'-0" Bridges



140'-0" Bridge



150'-0" Bridge

Pile Plan – 0° Skew
Timber Piling

Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	10	10	11	11	12	13	13	15	16
Pu, Strength 1 Design Load - kips	483	515	546	585	623	666	708	Δ830	Δ879

Δ Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

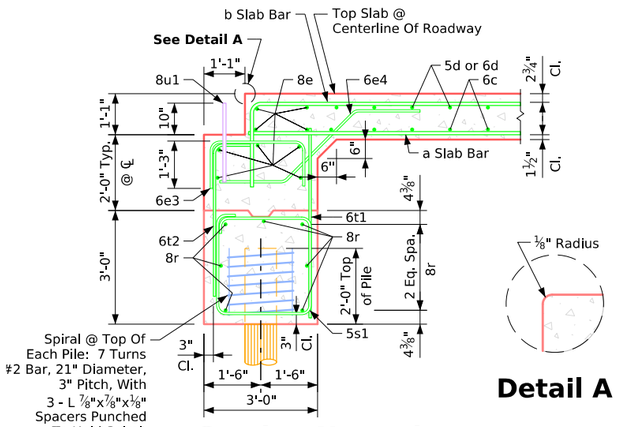
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 0° Skew - Timber Piling (2 of 2)

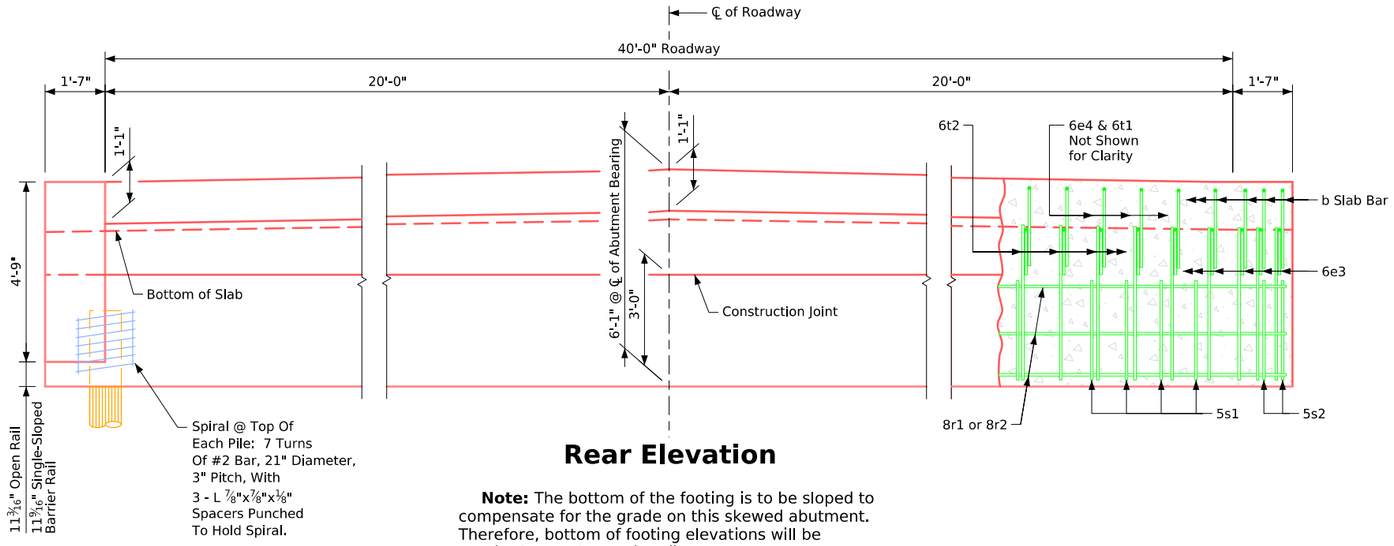
J40-30-25

Revised 09-2026: Updated Bridge Engineer signature.



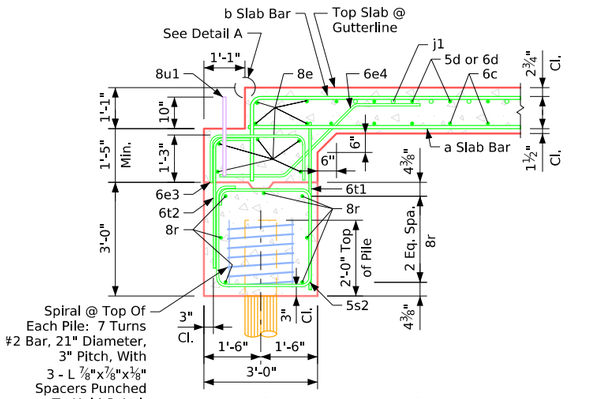
Section Normal to Abutment @ ℄

Detail A

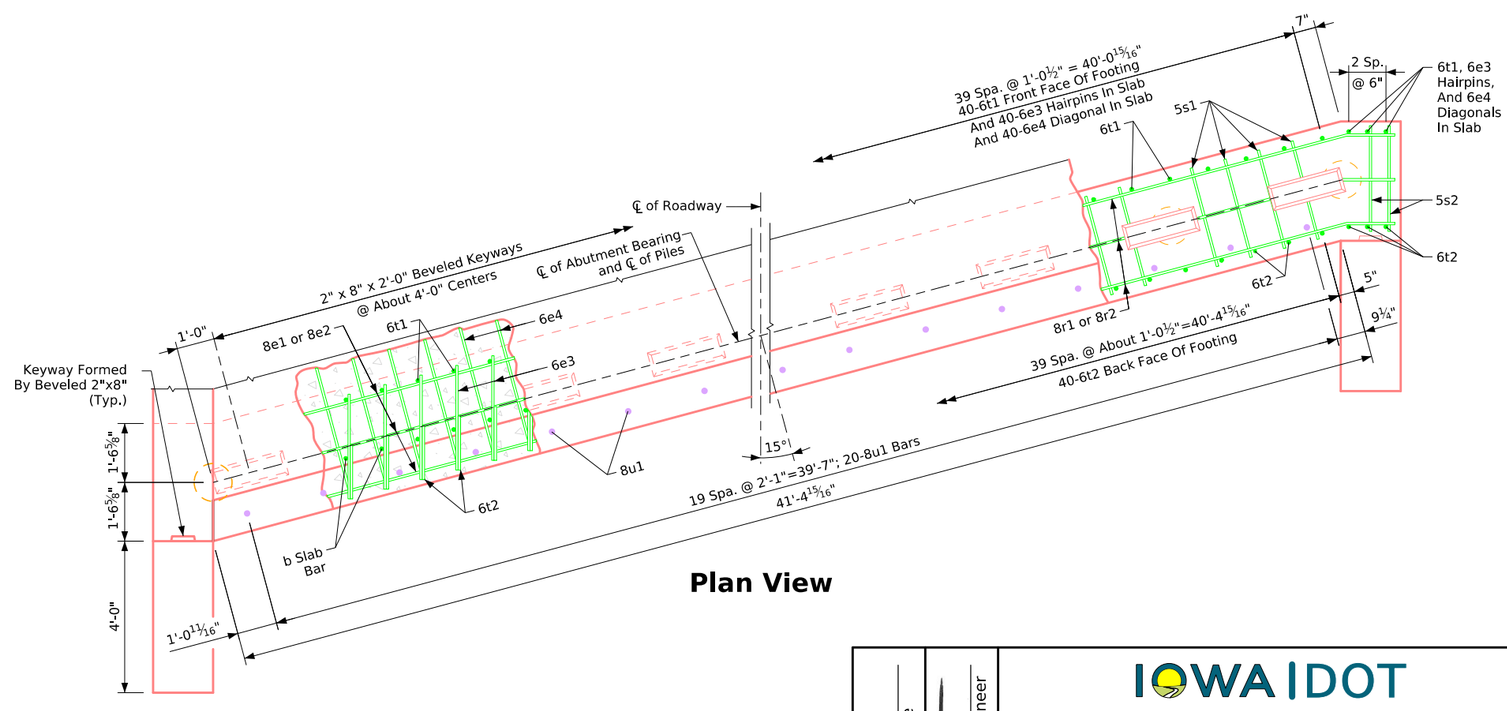


Rear Elevation

Note: The bottom of the footing is to be sloped to compensate for the grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.



Section Normal to Abutment @ Gutter Line



Plan View

ABUTMENT NOTES:

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet apply only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar shall be 2 inches unless otherwise noted or shown.

Timber piles shall be driven to full penetration if practicable, but in no case to a bearing value less than specified in the design plans. Timber piles shall not be driven to more than 160 tons.

All reinforcing steel shall be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for a 20 lbs. per sq. ft. future wearing surface.

NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

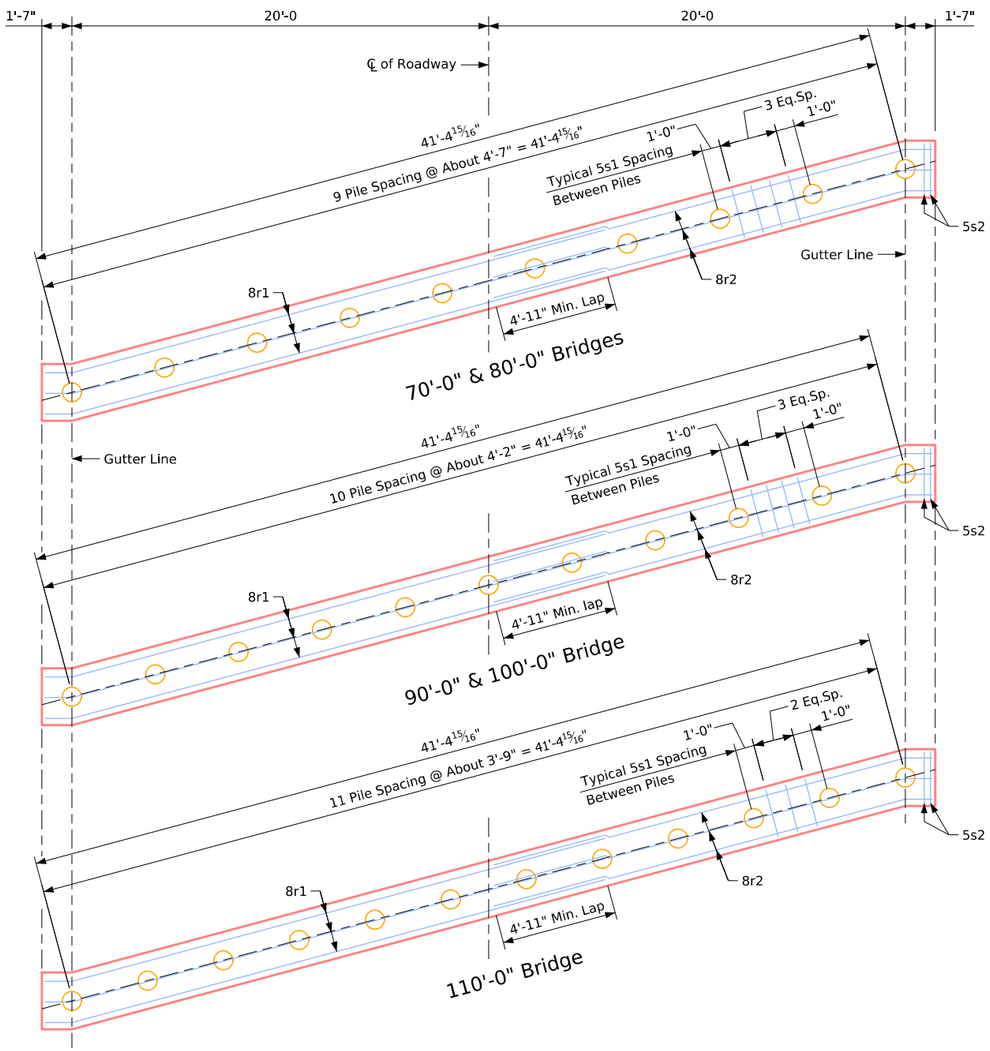
Continuous Concrete Slab Bridge

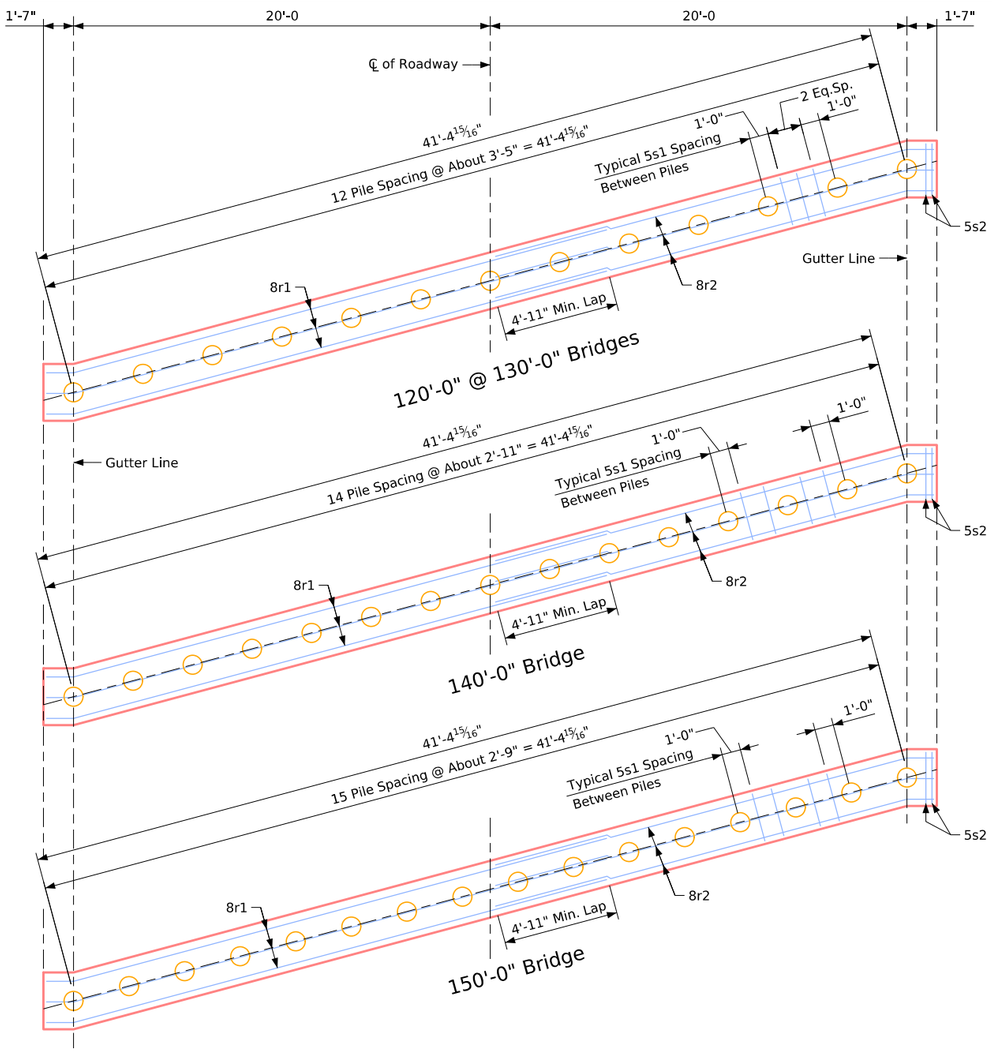
July, 2025

Abutment Details 15° Skew - Timber Piling (1 of 2)

J40-31-25

Revised 09-2026: Updated Bridge Engineer signature.





Pile Plan – 15° Skew
Timber Piling

Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	10	10	11	11	12	13	13	15	16
Pu, Strength 1 Design Load - kips	488	520	550	590	627	671	713	Δ835	Δ884

Δ Includes dynamic load allowance

note: pu, strength 1 design load (kips) is not the value used in the field for driving piles.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

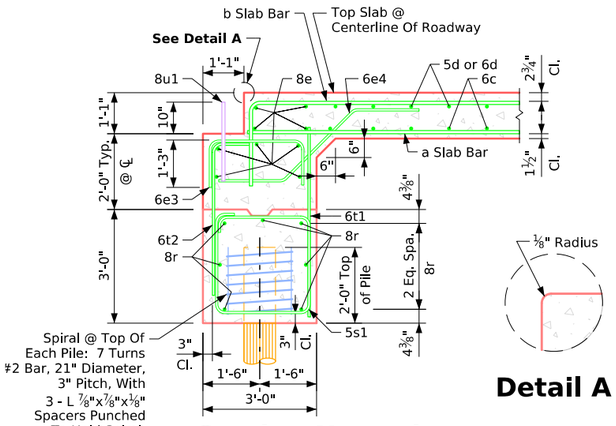
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 15° Skew - Timber Piling (2 of 2)

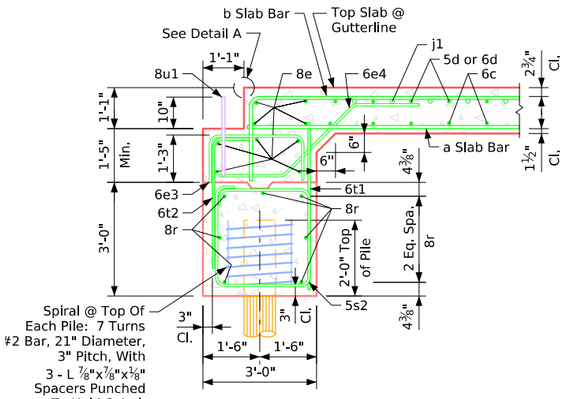
J40-32-25

Revised 09-2026: Updated Bridge Engineer signature.



Section Normal to Abutment @ ℄

Detail A



Section Normal to Abutment @ Gutter Line

ABUTMENT NOTES:

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet apply only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar shall be 2 inches unless otherwise noted or shown.

Timber piles shall be driven to full penetration if practicable, but in no case to a bearing value less than specified in the design plans. Timber piles shall not be driven to more than 160 tons.

All reinforcing steel shall be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for a 20 lbs. per sq. ft. future wearing surface.

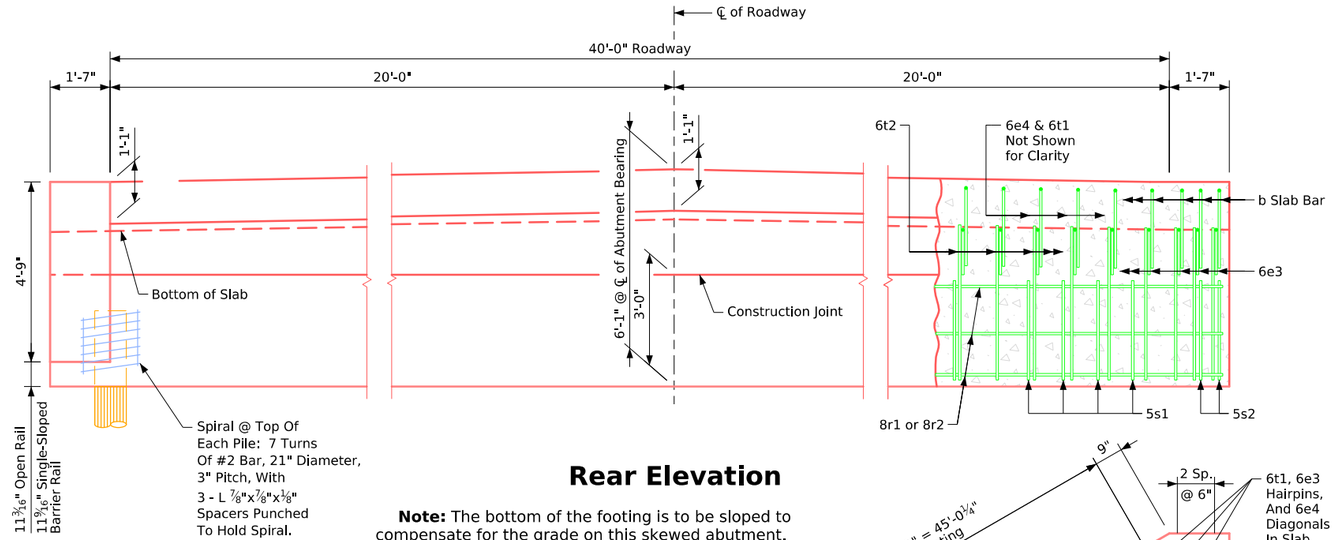
NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

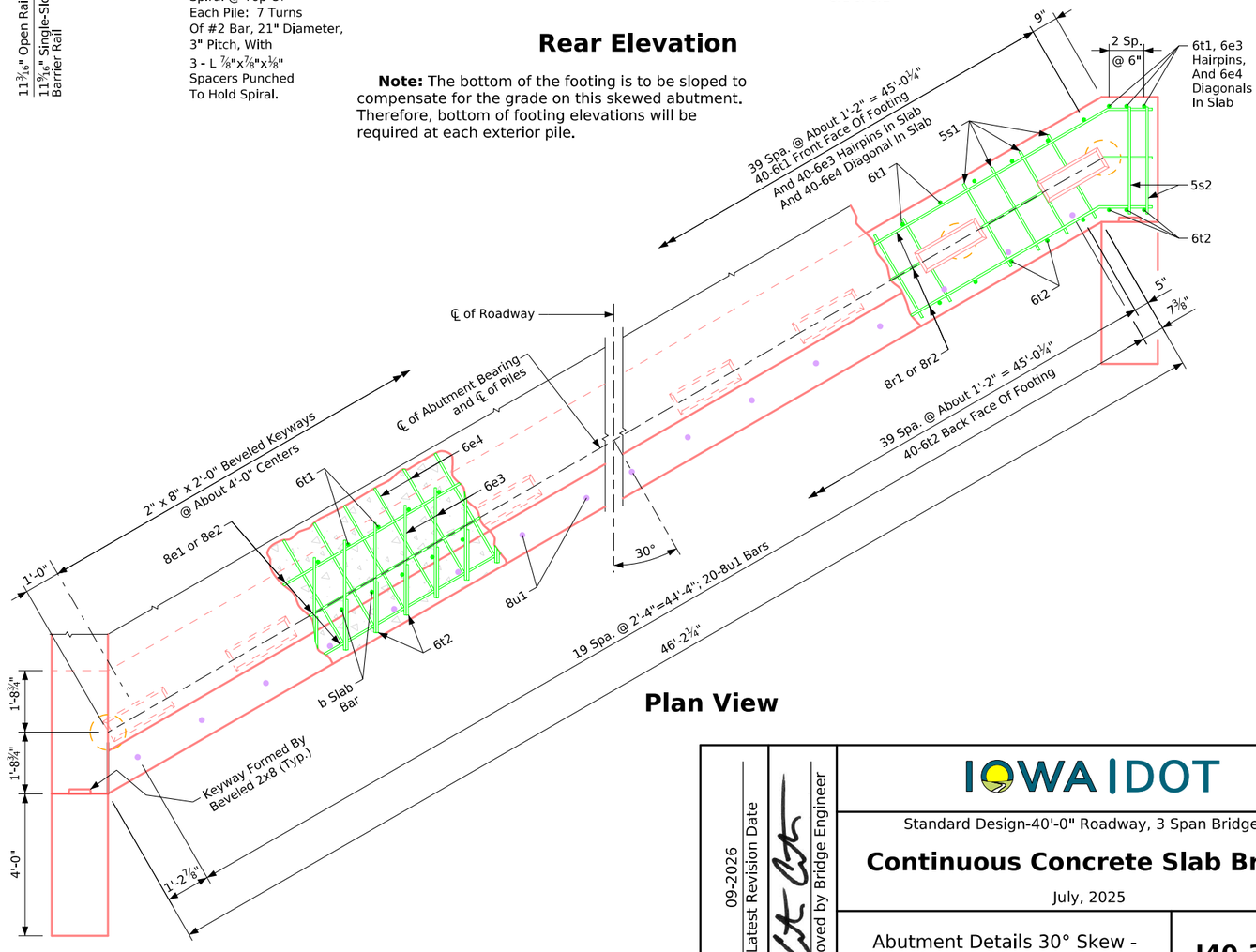
5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.



Rear Elevation

Note: The bottom of the footing is to be sloped to compensate for the grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.



Plan View

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

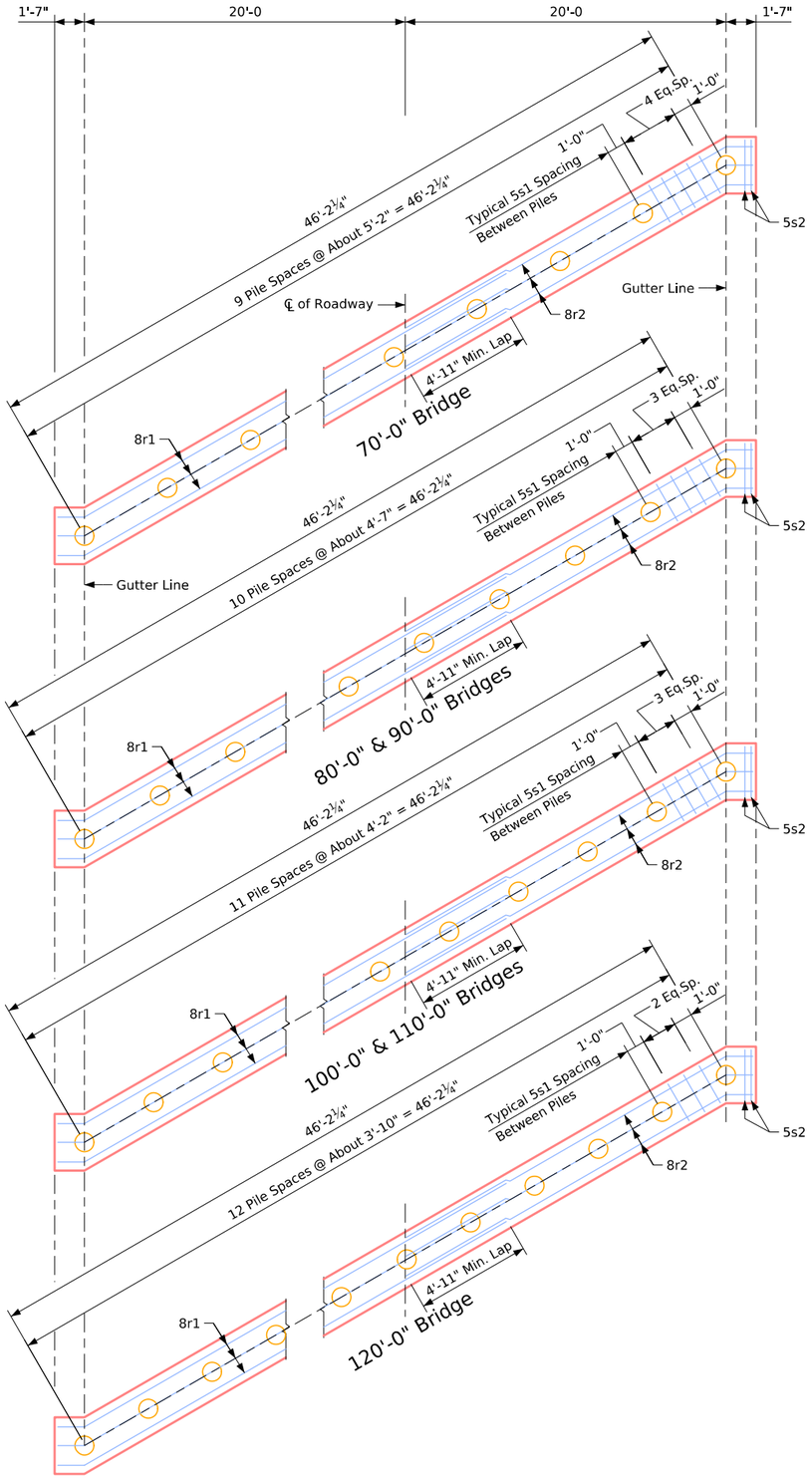
Continuous Concrete Slab Bridge

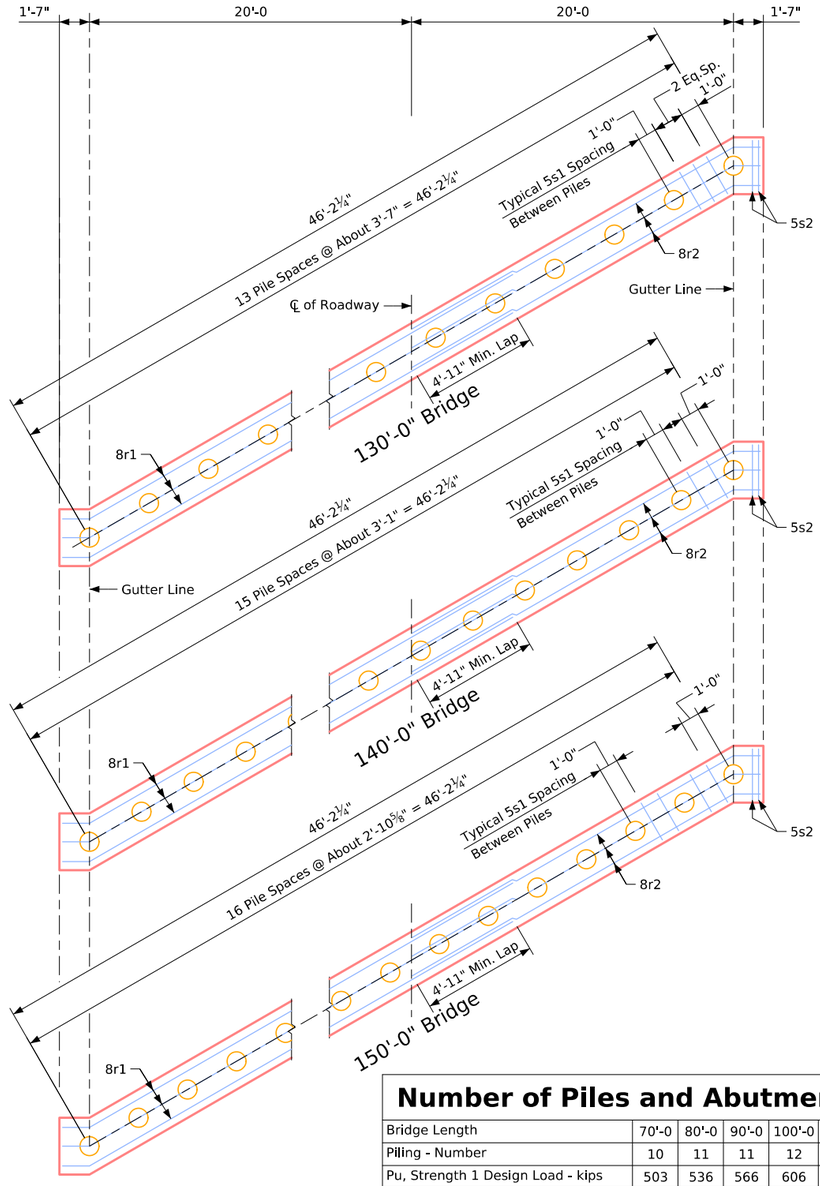
July, 2025

Abutment Details 30° Skew - Timber Piling (1 of 2)

J40-33-25

Revised 09-2026: Updated Bridge Engineer signature.





Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	10	11	11	12	12	13	14	16	17
Pu, Strength 1 Design Load - kips	503	536	566	606	644	687	729	Δ852	Δ901

Δ Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

Pile Plan – 30° Skew
Timber Piling

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

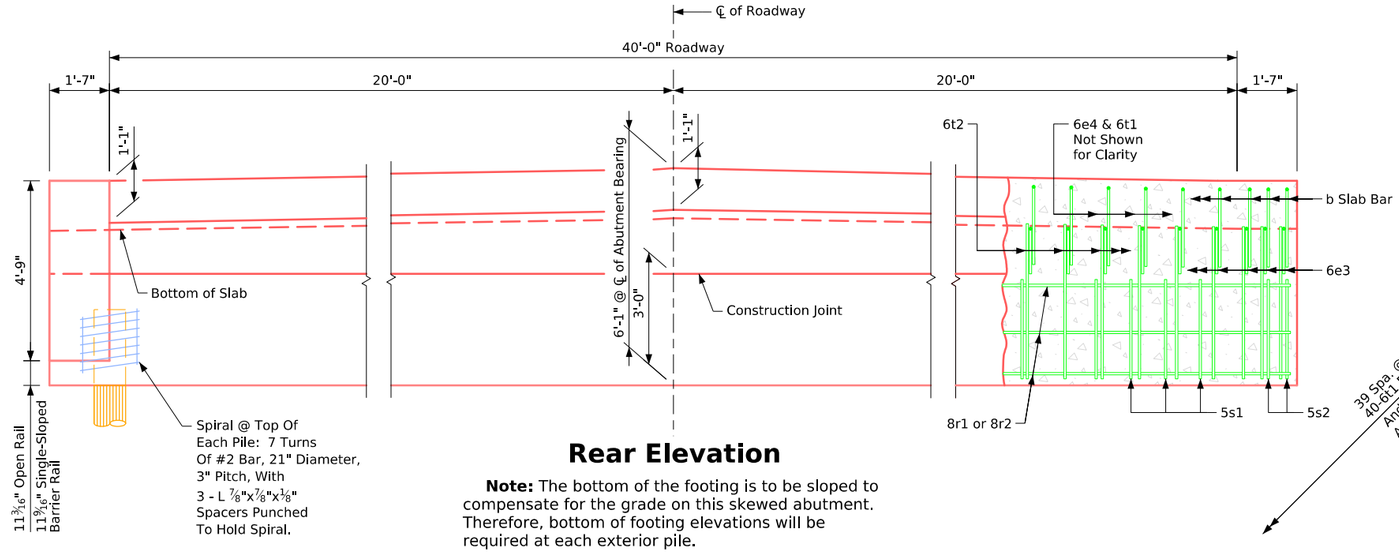
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 30° Skew - Timber Piling (2 of 2)

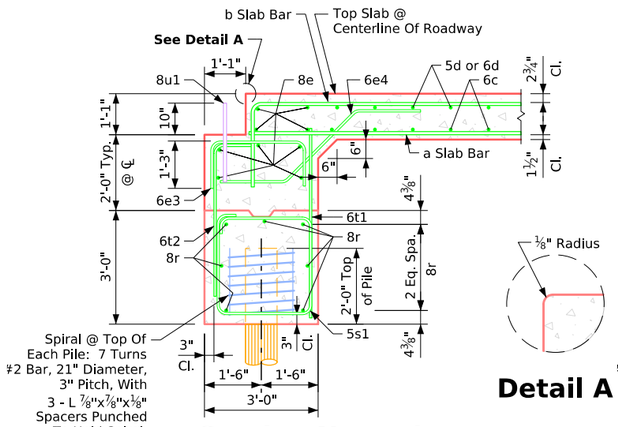
J40-34-25

Revised 09-2026: Updated Bridge Engineer signature.



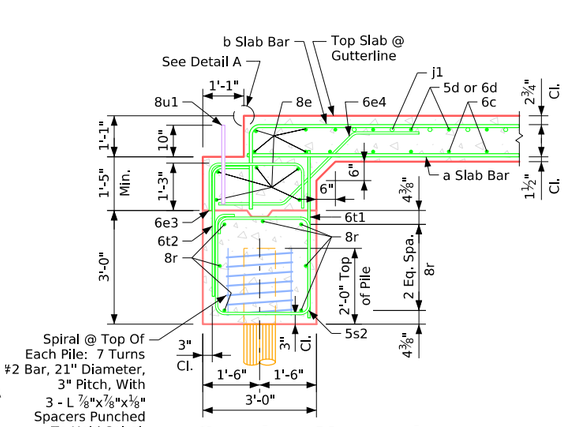
Rear Elevation

Note: The bottom of the footing is to be sloped to compensate for the grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.

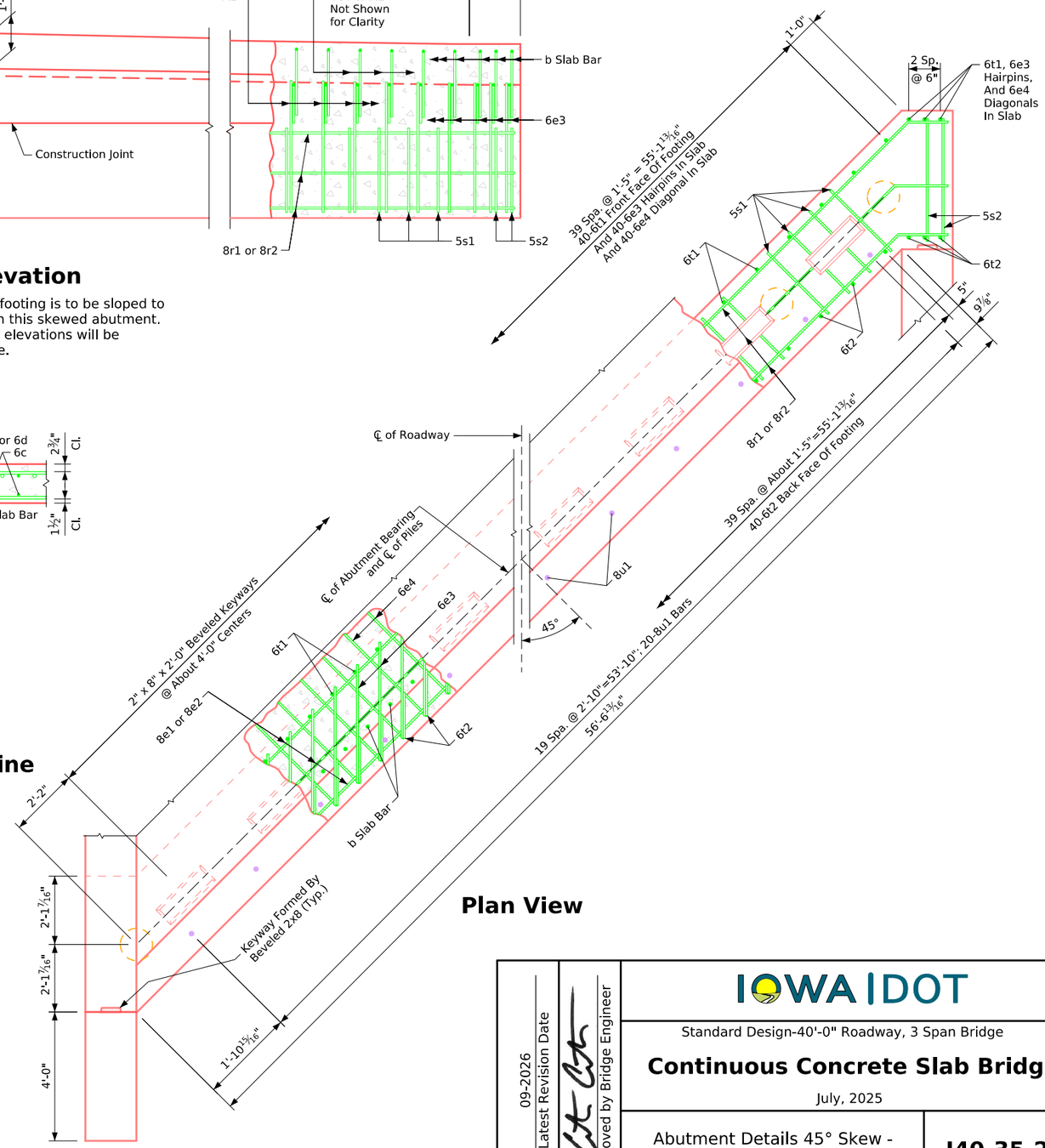


Section Normal to Abutment @ ℄

Detail A



Section Normal to Abutment @ Gutter Line



Plan View

ABUTMENT NOTES:

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet apply only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar shall be 2 inches unless otherwise noted or shown.

Timber piles shall be driven to full penetration if practicable, but in no case to a bearing value less than specified in the design plans. Timber piles shall not be driven to more than 160 tons.

All reinforcing steel shall be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for a 20 lbs. per sq. ft. future wearing surface.

NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

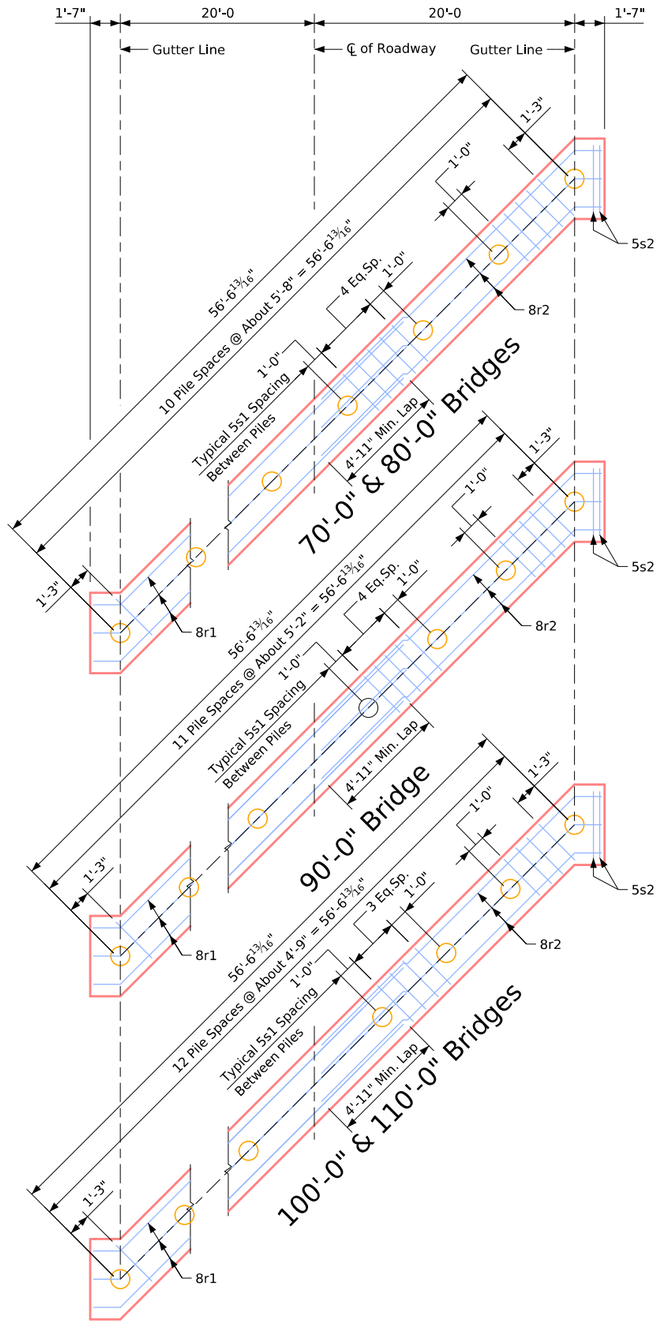
Continuous Concrete Slab Bridge

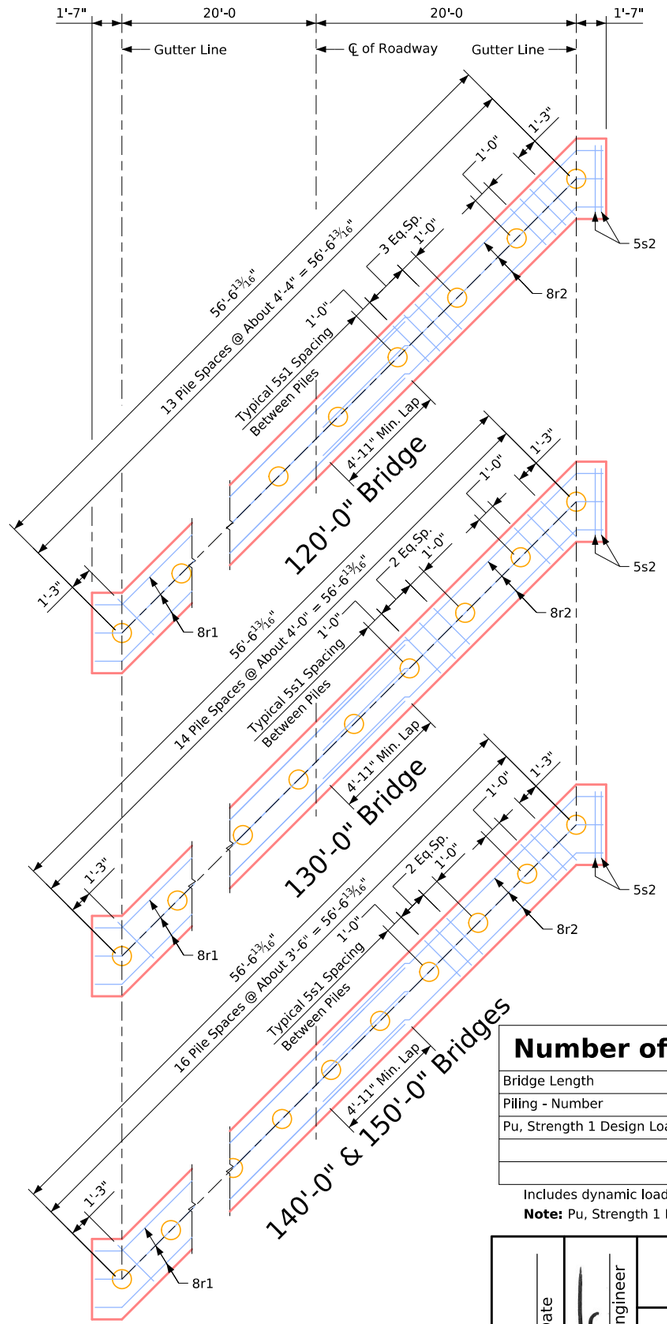
July, 2025

Abutment Details 45° Skew - Timber Piling (1 of 2)

J40-35-25

Revised 09-2026; Updated Bridge Engineer signature.





Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	11	11	12	13	13	14	15	17	17
Pu, Strength 1 Design Load - kips	538	570	601	641	679	723	765	Δ888	Δ938

Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

Pile Plan – 45° Skew
Timber Piling

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Abutment Details 45° Skew - Timber Piling (2 of 2)

J40-36-25

Revised 09-2026: Updated Bridge Engineer signature.

BILL OF REINFORCING STEEL - ONE ABUTMENT - 0° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		26'-4	7	492	7	492	7	492	7	492	7	492	7	492	7	492	7	492	7	492
8r2	Abutment Footing Longitudinal		21'-4	7	399	7	399	7	399	7	399	7	399	7	399	7	399	7	399	7	399
5s1	Abutment Footing Hoops		11'-0	40	459	40	459	34	390	34	390	37	425	40	459	40	459	32	367	34	390
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	10	64	10	64	11	71	11	71	12	77	13	84	13	84	15	96	16	103
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	30	39	30	39	33	43	33	43	36	47	39	50	39	50	45	58	48	62
	Reinforcing steel epoxy coated - total (lbs.)				2184		2184		2126		2126		2171		2215		2215		2143		2177

BILL OF REINFORCING STEEL - ONE ABUTMENT - 15° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		27'-2	7	508	7	508	7	508	7	508	7	508	7	508	7	508	7	508	7	508
8r2	Abutment Footing Longitudinal		22'-1	7	413	7	413	7	413	7	413	7	413	7	413	7	413	7	413	7	413
5s1	Abutment Footing Hoops		11'-0	36	413	36	413	40	459	40	459	33	379	36	413	36	413	28	321	30	344
5s2	Abutment Footing Hoops		11'-3	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	10	64	10	64	11	71	11	71	12	77	13	84	13	84	15	96	16	103
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	30	39	30	39	33	43	33	43	36	47	39	50	39	50	45	58	48	62
	Reinforcing steel epoxy coated - total (lbs.)				2215		2215		2272		2272		2202		2246		2246		2174		2208

BILL OF REINFORCING STEEL - ONE ABUTMENT - 30° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		29'-6	7	551	7	551	7	551	7	551	7	551	7	551	7	551	7	551	7	551
8r2	Abutment Footing Longitudinal		24'-5	7	456	7	456	7	456	7	456	7	456	7	456	7	456	7	456	7	456
5s1	Abutment Footing Hoops		11'-0	45	516	40	459	40	459	44	505	44	505	36	413	39	447	30	344	32	367
5s2	Abutment Footing Hoops		11'-11	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	10	64	11	71	11	71	12	77	12	77	13	84	14	90	16	103	17	109
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	30	39	33	43	33	43	36	47	36	47	39	50	42	54	48	62	51	66
	Reinforcing steel epoxy coated - total (lbs.)				2407		2361		2361		2417		2417		2335		2379		2297		2330

BILL OF REINFORCING STEEL - ONE ABUTMENT - 45° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		34'-8	7	648	7	648	7	648	7	648	7	648	7	648	7	648	7	648	7	648
8r2	Abutment Footing Longitudinal		29'-7	7	553	7	553	7	553	7	553	7	553	7	553	7	553	7	553	7	553
5s1	Abutment Footing Hoops		11'-0	50	574	50	574	55	631	48	551	48	551	52	597	42	482	48	551	48	551
5s2	Abutment Footing Hoops		13'-6	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	11	71	11	71	12	77	13	84	13	84	14	90	15	96	17	109	17	109
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	33	43	33	43	36	47	39	50	39	50	42	54	45	58	51	66	51	66
	Reinforcing steel epoxy coated - total (lbs.)				2676		2676		2743		2673		2673		2729		2624		2714		2714

Note: The pile spirals and spiral spacers are to be non-coated reinforcing but may be epoxy-coated at the contractor's option and expense.

ESTIMATED QUANTITIES - ONE ABUT. - 0° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	13.8	13.8	13.8	13.8	13.7	13.6	13.6	13.5	13.5
Reinforcing Steel, Epoxy-Coated	lbs.	2184	2184	2126	2126	2171	2215	2215	2143	2177
Wood Piles (Treated)	no.	10	10	11	11	12	13	13	15	16
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	150	150

ESTIMATED QUANTITIES - ONE ABUT. - 15° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	14.3	14.3	14.3	14.3	14.2	14.1	14.1	14.0	14.0
Reinforcing Steel, Epoxy-Coated	lbs.	2215	2215	2272	2272	2202	2246	2246	2174	2208
Wood Piles (Treated)	no.	10	10	11	11	12	13	13	15	16
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	150	160

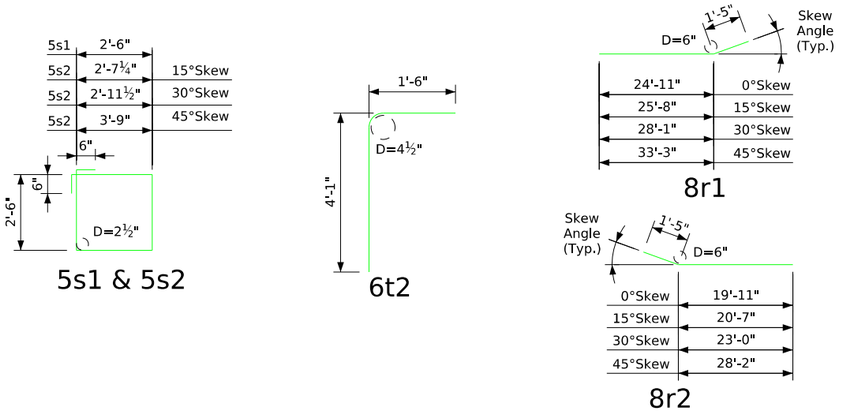
ESTIMATED QUANTITIES - ONE ABUT. - 30° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	16.0	16.0	16.0	15.9	15.9	15.8	15.8	15.7	15.6
Reinforcing Steel, Epoxy-Coated	lbs.	2407	2361	2417	2417	2335	2379	2297	2330	
Wood Piles (Treated)	no.	10	11	11	12	12	13	14	16	17
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	160	170

ESTIMATED QUANTITIES - ONE ABUT. - 45° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	19.7	19.7	19.7	19.6	19.6	19.6	19.5	19.4	19.4
Reinforcing Steel, Epoxy-Coated	lbs.	2676	2676	2743	2673	2673	2729	2624	2714	2714
Wood Piles (Treated)	no.	11	11	12	13	13	14	15	17	17
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	170	170

BENT BAR DETAILS



Note: All Dimensions Are Out To Out. D=pin Diameter.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

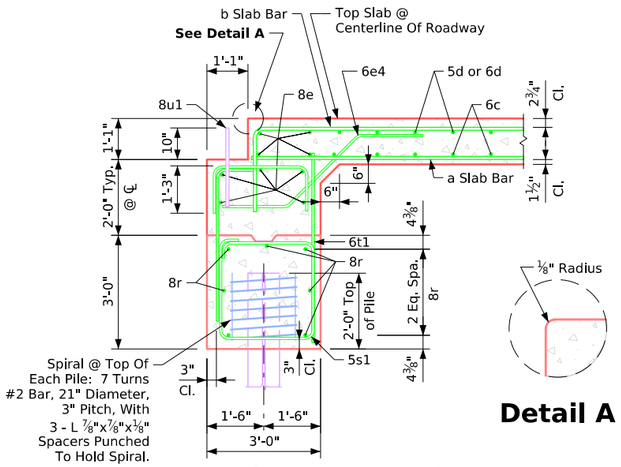
Continuous Concrete Slab Bridge

July, 2025

Abutment General Details – Timber Piling

J40-37-25

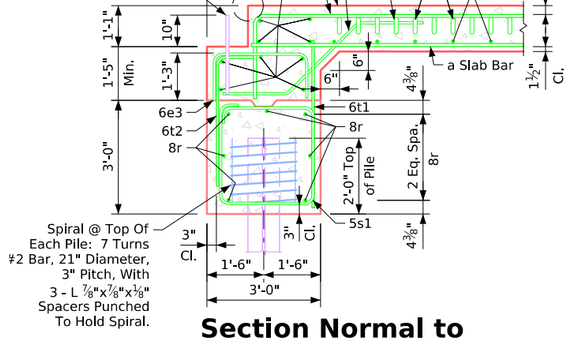
Revised 09-2026: Updated Bridge Engineer signature.



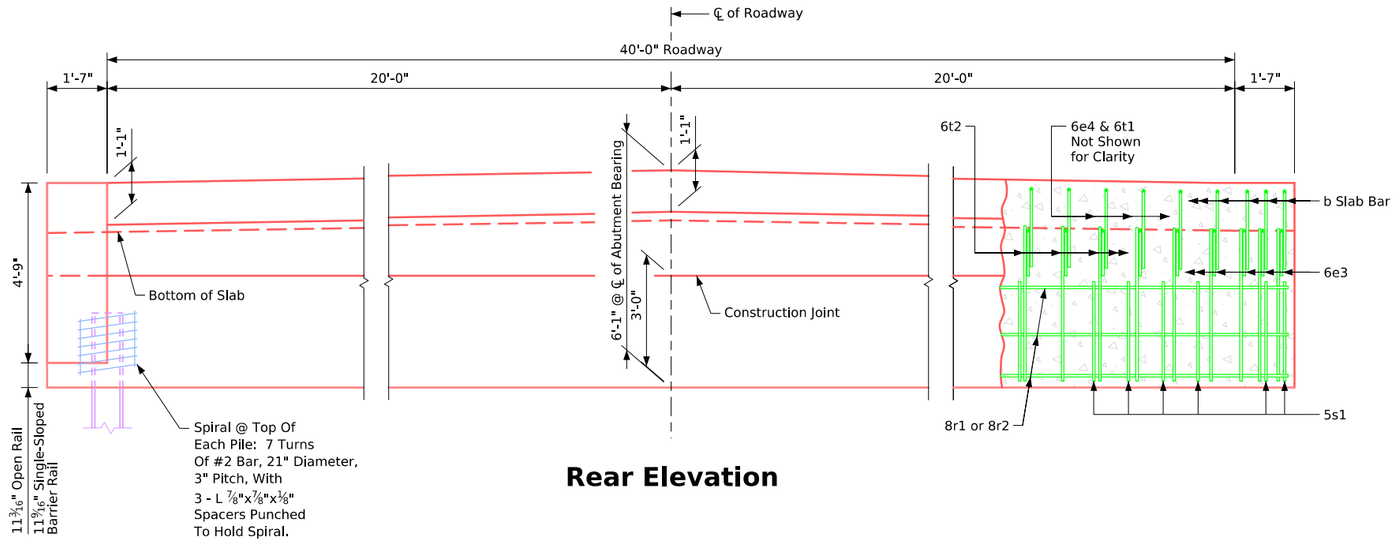
Detail A

Section Normal to Abutment @ ℄

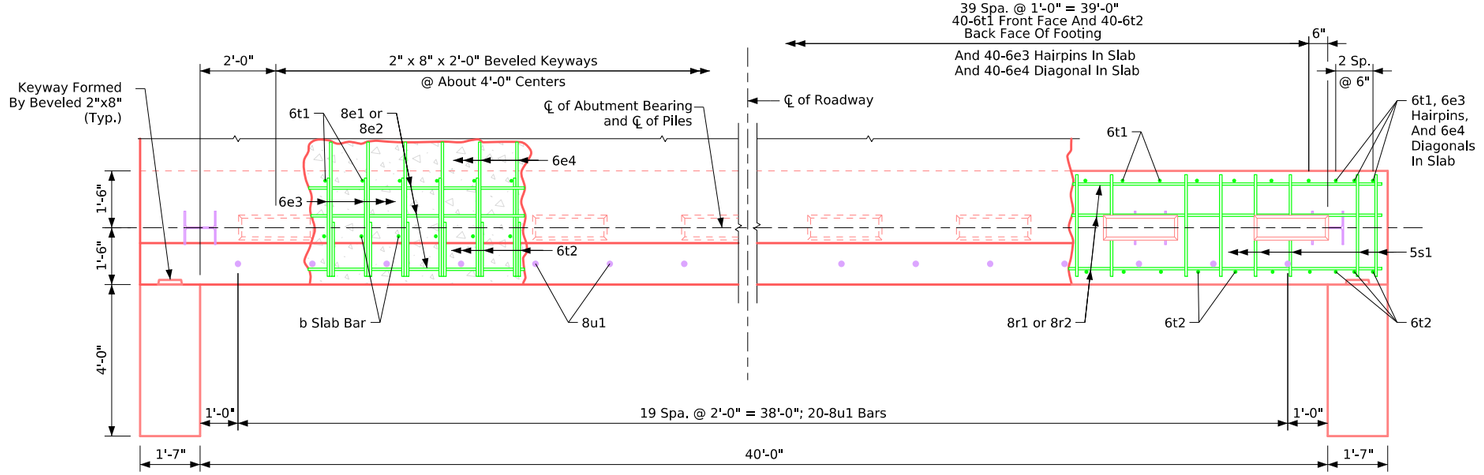
(Bridge Lengths 70-110ft)



Section Normal to Abutment @ Gutter Line



Rear Elevation



Plan View

ABUTMENT NOTES:

All piling are HP 10x42.

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on steel piles. If rock is encountered closer than 12'-0" below the abutment footing, special analysis may be required.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar is to be 2 inches unless otherwise noted or shown.

Steel abutment piles shall be driven to full penetration if practicable, but in no case to a bearing value less than shown in the design plans.

All reinforcing steel is to be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for 20 lbs. per sq. ft. future wearing surface.

NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

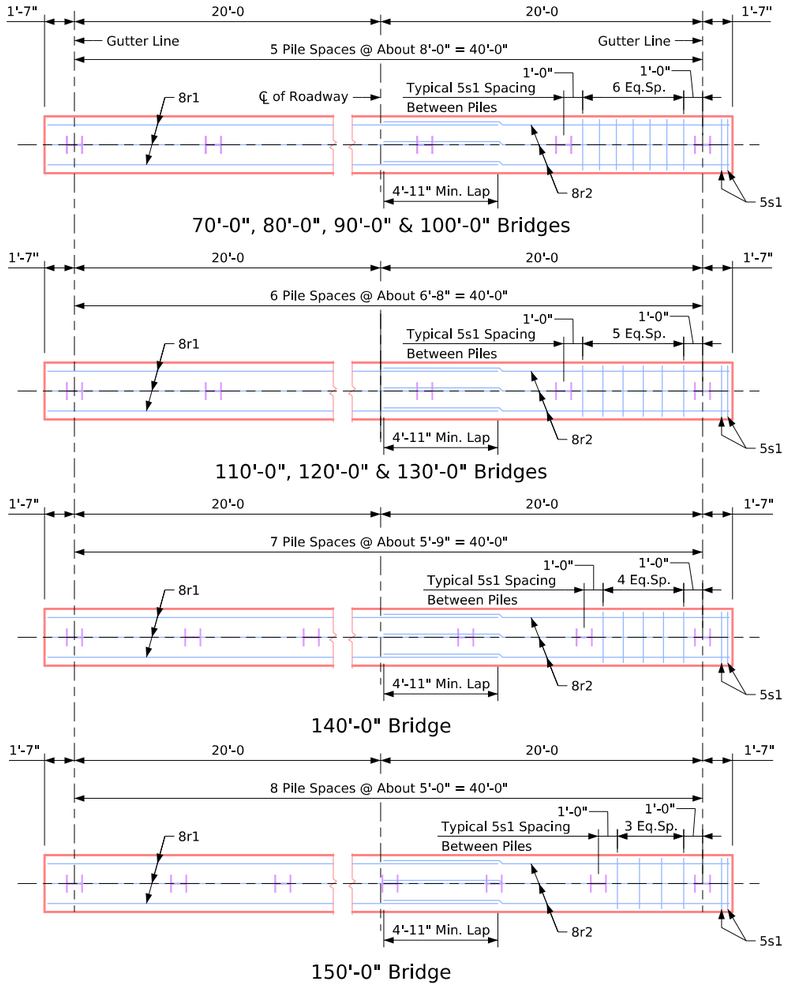
July, 2025

Abutment Details 0° Skew -
Steel Piling (1 of 2)

J40-38-25

Revised 09-2026: Updated Bridge Engineer signature.

5:14:57 PM 9/4/2026 bkloss pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\J40-25.dgn



Pile Plan - 0° Skew
Steel Piling

Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	6	6	6	6	7	7	7	8	9
Pu, Strength 1 Design Load - kips	483	515	546	585	623	666	708	Δ830	Δ879

Δ Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

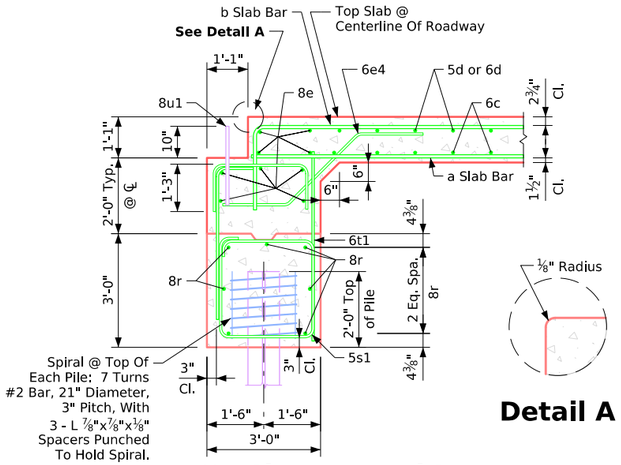
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 0° Skew -
Steel Piling (2 of 2)

J40-39-25

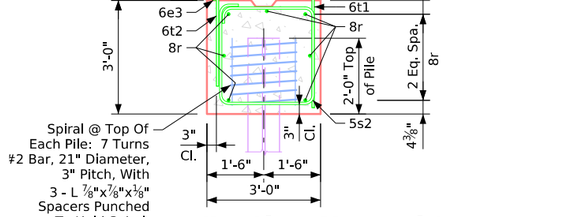
Revised 09-2026: Updated Bridge Engineer signature.



Detail A

Section Normal to Abutment @ ℄

(Bridge Lengths 70-110ft)



Section Normal to Abutment @ Gutter Line

ABUTMENT NOTES:

All piling are HP 10x42.

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on steel piles. If rock is encountered closer than 12'-0" below the abutment footing, special analysis may be required.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar is to be 2 inches unless otherwise noted or shown.

Steel abutment piles shall be driven to full penetration if practicable, but in no case to a bearing value less than shown in the design plans.

All reinforcing steel is to be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for 20 lbs. per sq. ft. future wearing surface.

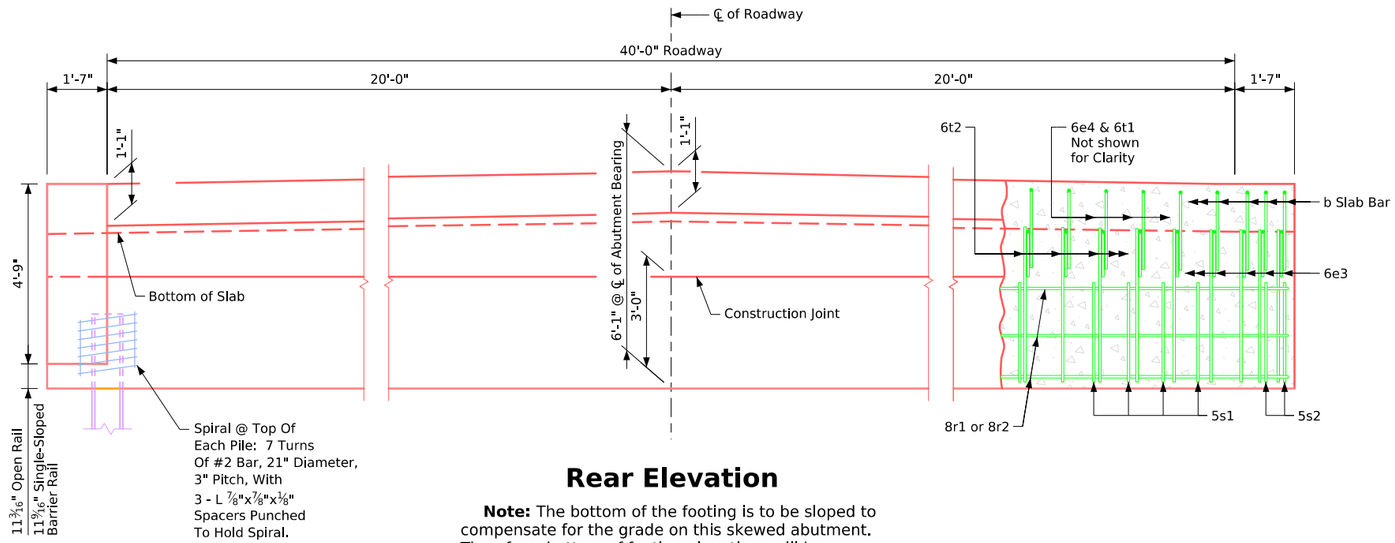
NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

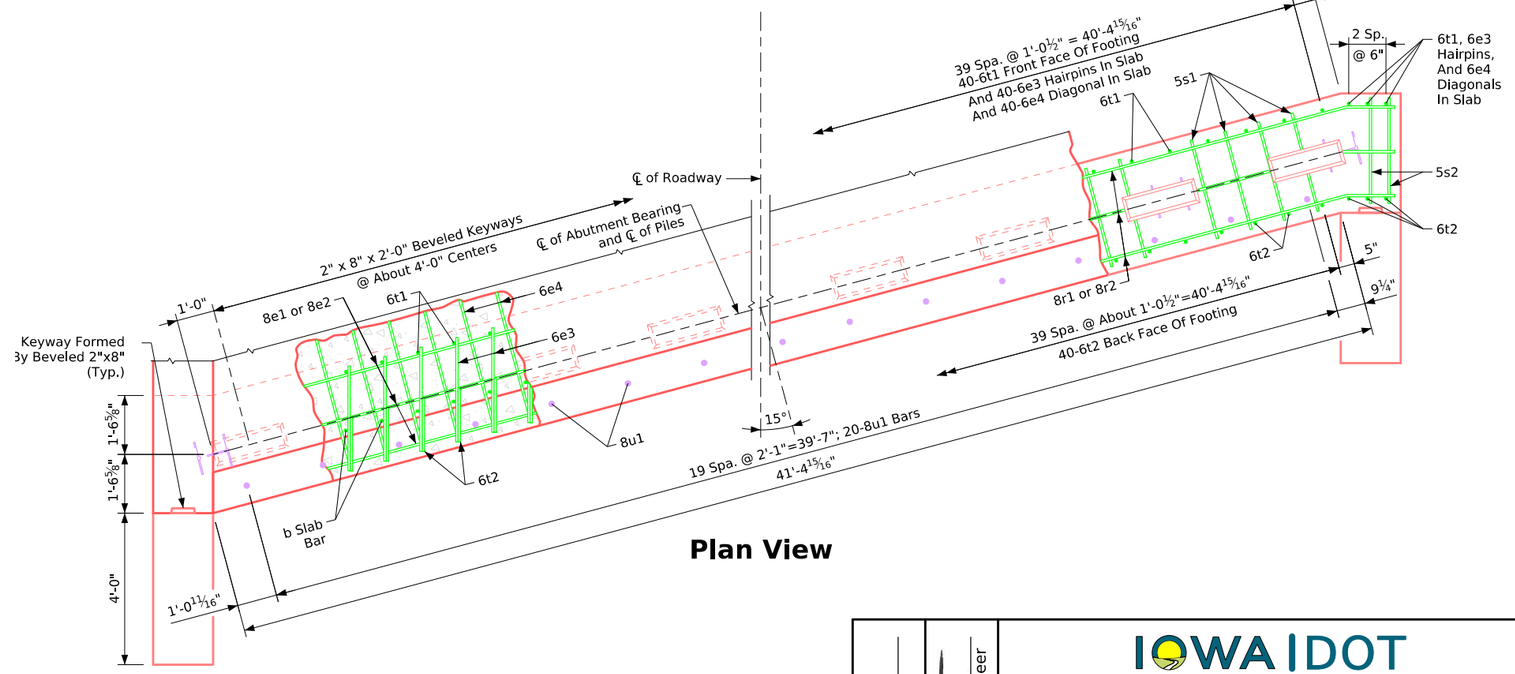
5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.



Rear Elevation

Note: The bottom of the footing is to be sloped to compensate for the grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.



Plan View

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

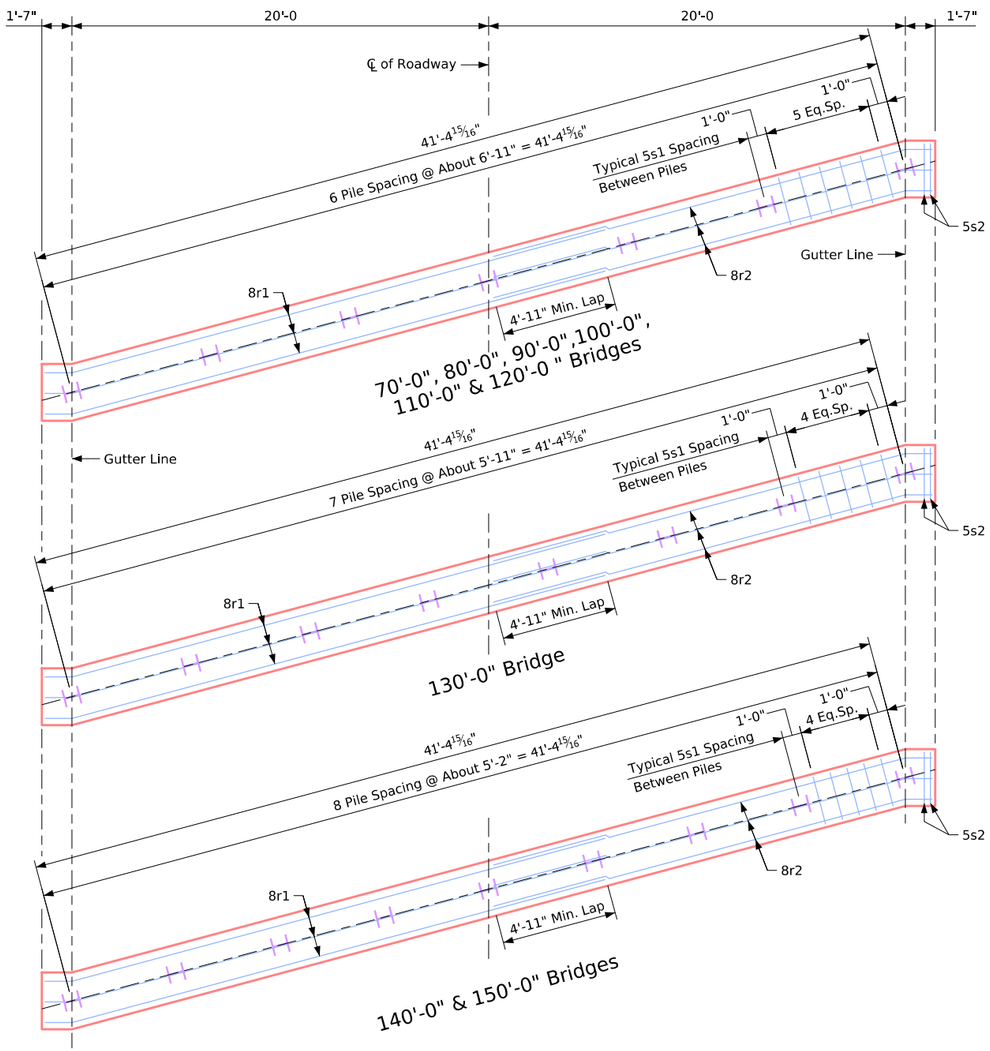
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 15° Skew - Steel Piling (1 of 2)

J40-40-25

Revised 09-2026: Updated Bridge Engineer signature.



Pile Plan - 15° Skew
Steel Piling

Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	7	7	7	7	7	7	8	9	9
Pu, Strength 1 Design Load - kips	488	520	550	590	627	671	713	Δ835	Δ884

Δ Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

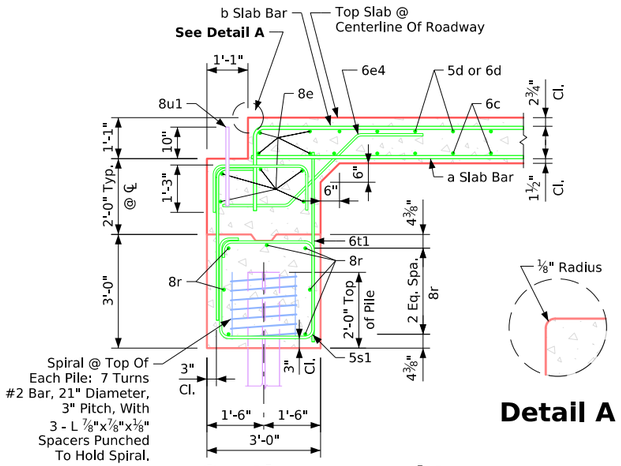
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 15° Skew -
Steel Piling (2 of 2)

J40-41-25

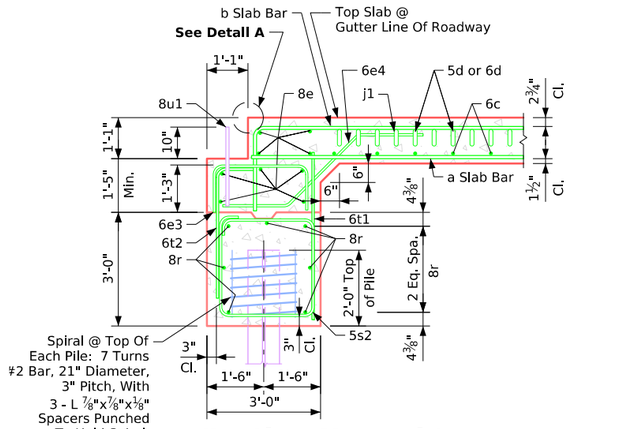
Revised 09-2026; Updated Bridge Engineer signature.



Detail A

Section Normal to Abutment @ ℄

(Bridge Lengths 70-110ft)



Section Normal to Abutment @ Gutter Line

ABUTMENT NOTES:

All piling are HP 10x42.

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on steel piles. If rock is encountered closer than 12'-0" below the abutment footing, special analysis may be required.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar is to be 2 inches unless otherwise noted or shown.

Steel abutment piles shall be driven to full penetration if practicable, but in no case to a bearing value less than shown in the design plans.

All reinforcing steel is to be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for 20 lbs. per sq. ft. future wearing surface.

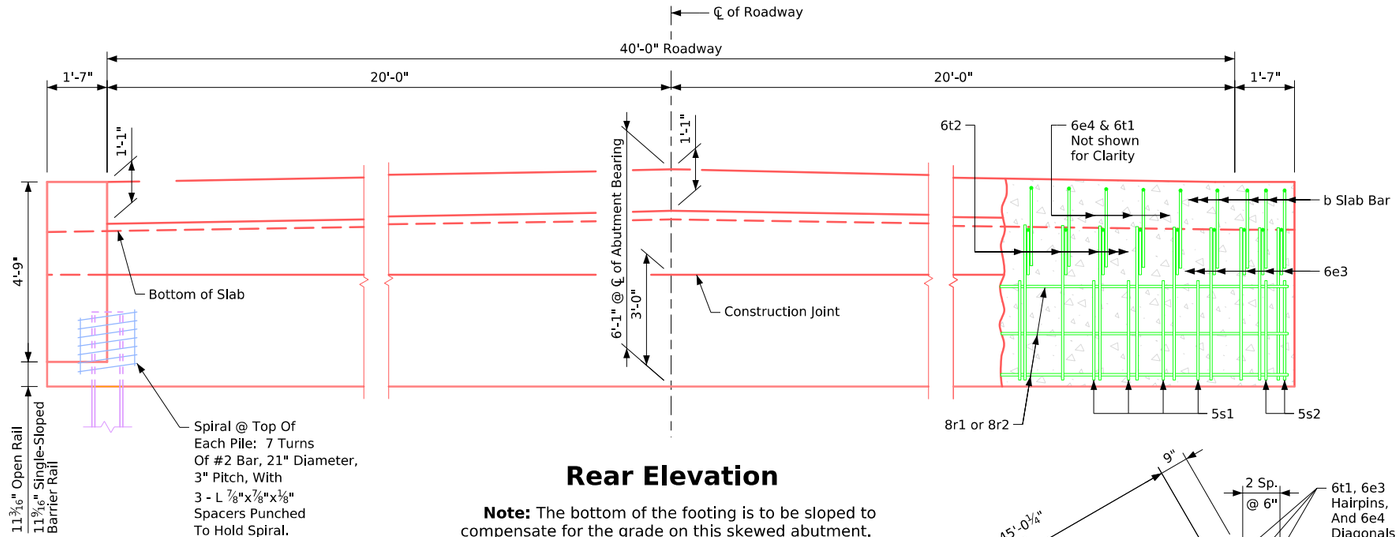
NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

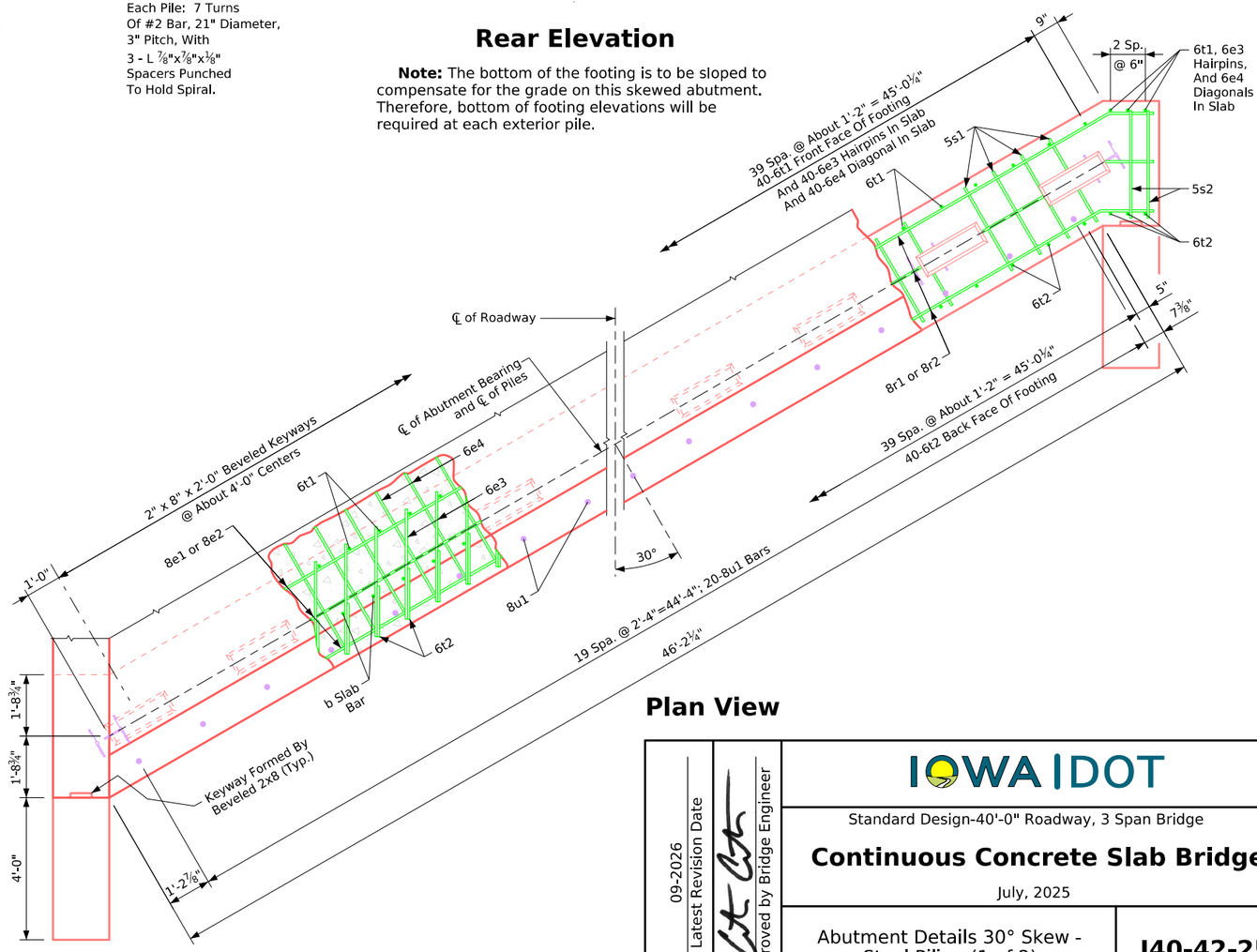
5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e bars are included in the **Superstructure Quantities** for each individual bridge length.



Rear Elevation

Note: The bottom of the footing is to be sloped to compensate for the grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.



Plan View

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

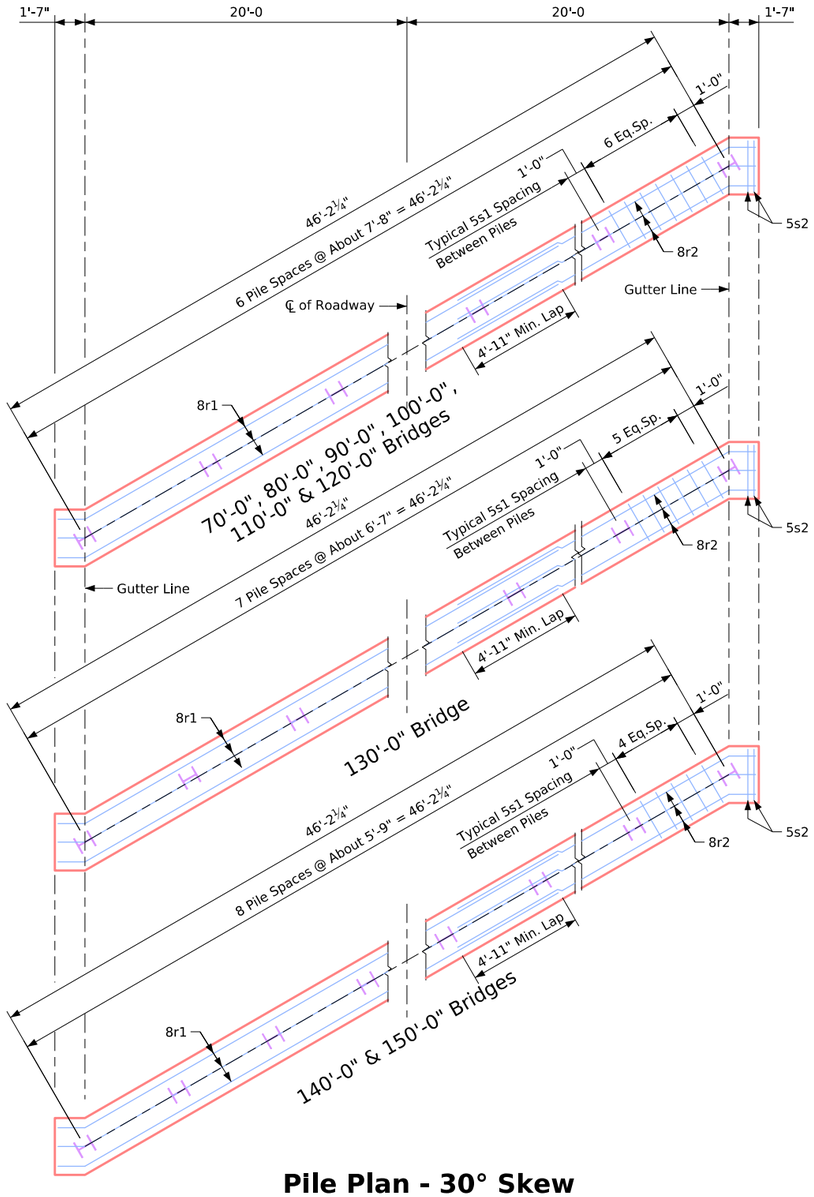
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 30° Skew - Steel Piling (1 of 2)

J40-42-25

Revised 09-2026: Updated Bridge Engineer signature.



Pile Plan - 30° Skew
Steel Piling

Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	7	7	7	7	7	7	8	9	9
Pu, Strength 1 Design Load - kips	503	536	566	606	644	687	729	Δ852	Δ901

Δ Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

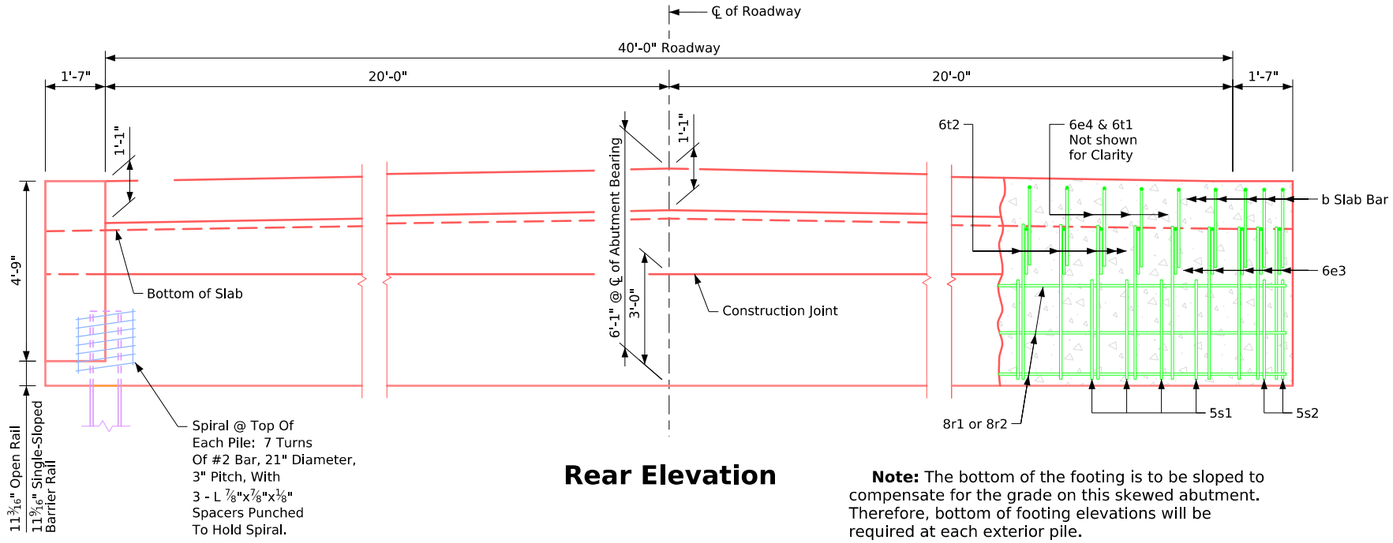
Continuous Concrete Slab Bridge

July, 2025

Abutment Details 30° Skew -
Steel Piling (2 of 2)

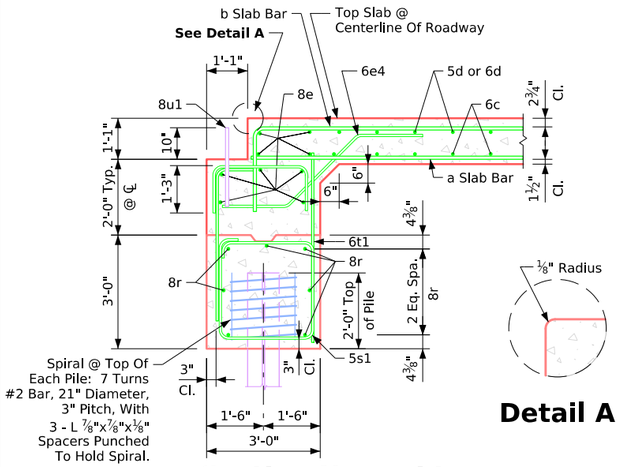
J40-43-25

Revised 09-2026: Updated Bridge Engineer signature.



Rear Elevation

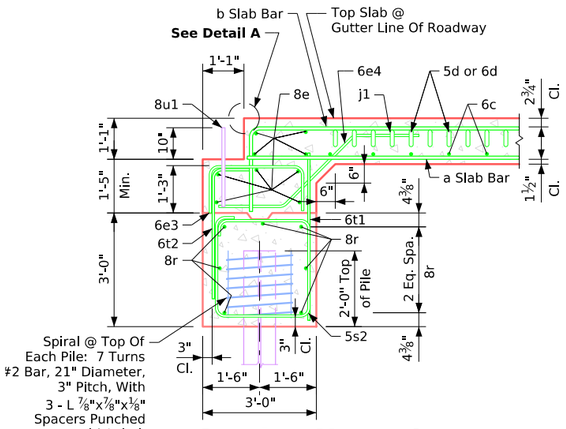
Note: The bottom of the footing is to be sloped to compensate for the grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.



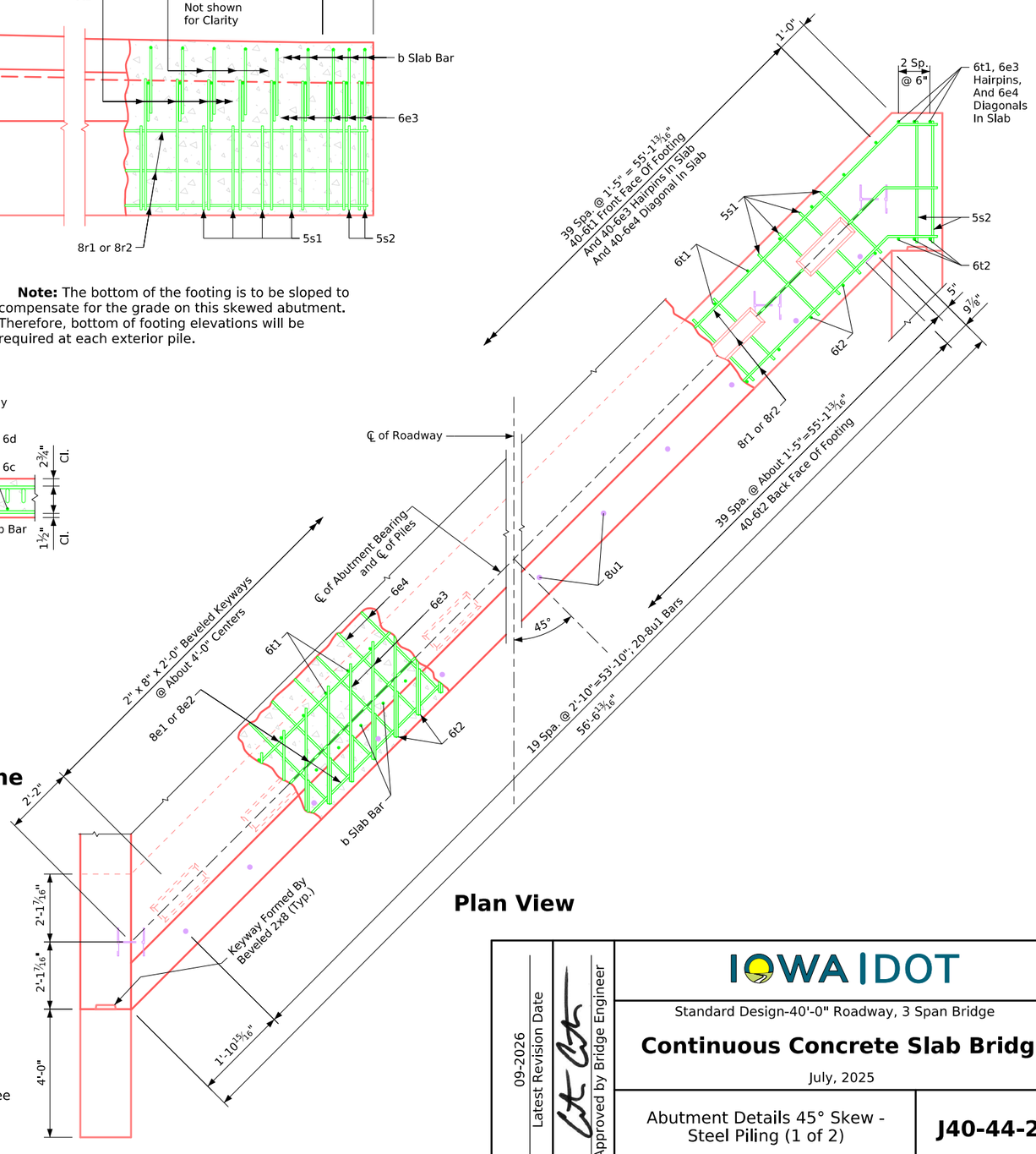
Section Normal to Abutment @ ℄

(Bridge Lengths 70-110ft)

Detail A



Section Normal to Abutment @ Gutter Line



Plan View

ABUTMENT NOTES:

All piling are HP 10x42.

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on steel piles. If rock is encountered closer than 12'-0" below the abutment footing, special analysis may be required.

The minimum clear distance from the face of the concrete to the nearest reinforcing bar is to be 2 inches unless otherwise noted or shown.

Steel abutment piles shall be driven to full penetration if practicable, but in no case to a bearing value less than shown in the design plans.

All reinforcing steel is to be Grade 60.

Abutment piling was designed for HL-93 loading with an allowance for 20 lbs. per sq. ft. future wearing surface.

NOTES:

Barrier rails and reinforcement not shown.

Wing reinforcing not shown.

5n1 wing reinforcement shall be placed in the abutment footing before the footing is poured. For additional details, see Sheet **J40-20-25**.

6e3, 6e4, and 8e are included in the **Superstructure Quantities** for each individual bridge length.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

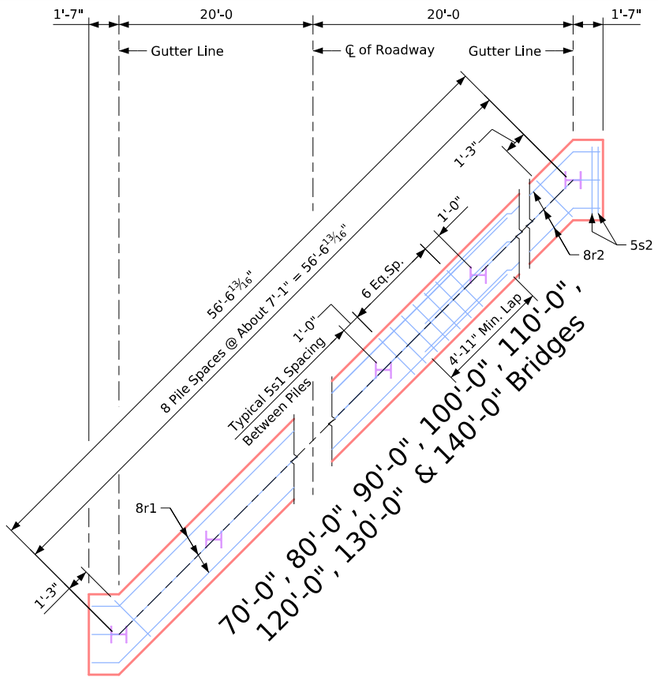
Continuous Concrete Slab Bridge

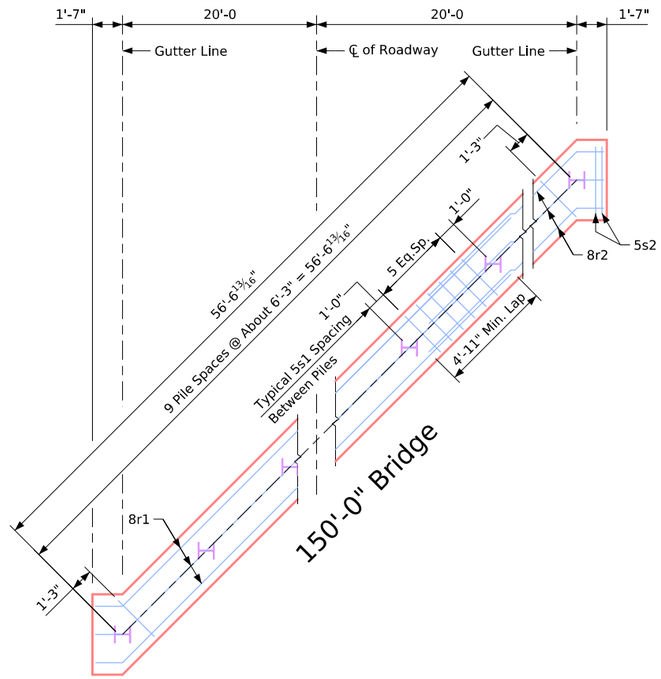
July, 2025

Abutment Details 45° Skew - Steel Piling (1 of 2)

J40-44-25

Revised 09-2026: Updated Bridge Engineer signature.





Pile Plan 45° Skew
Steel Piling

Note: All piles are to be oriented with the webs perpendicular to the ℄ of the Roadway as shown.

Number of Piles and Abutment Design Loads

Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Piling - Number	9	9	9	9	9	9	9	9	10
Pu, Strength 1 Design Load - kips	538	570	601	641	679	723	765	Δ888	Δ938

Δ Includes dynamic load allowance

Note: Pu, Strength 1 Design Load (kips) is not the value used in the field for driving piles.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Abutment Details 45° Skew - Steel Piling (2 of 2)

J40-45-25

Revised 09-2026: Updated Bridge Engineer signature.

Revised 09-2026: Updated Bridge Engineer signature. In "Estimated Quantities-One Abut." tables, corrected typo of Steel Piling HP 10x42 (was incorrectly shown as HP 10x24).

BILL OF REINFORCING STEEL - ONE ABUTMENT - 0° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		26'-4	7	492	7	492	7	492	7	492	7	492	7	492	7	492	7	492	7	492
8r2	Abutment Footing Longitudinal		21'-4	7	399	7	399	7	399	7	399	7	399	7	399	7	399	7	399	7	399
5s1	Abutment Footing Hoops		11'-0	39	447	39	447	39	447	39	447	40	459	40	459	40	459	39	447	36	413
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	6	39	6	39	6	39	6	39	7	45	7	45	7	45	8	51	9	58
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	18	24	18	24	18	24	18	24	21	27	21	27	21	27	24	31	27	35
	Reinforcing steel epoxy coated - total (lbs.)				2132		2132		2132		2132		2153		2153		2153		2151		2128

BILL OF REINFORCING STEEL - ONE ABUTMENT - 15° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		27'-2	7	508	7	508	7	508	7	508	7	508	7	508	7	508	7	508	7	508
8r2	Abutment Footing Longitudinal		22'-1	7	413	7	413	7	413	7	413	7	413	7	413	7	413	7	413	7	413
5s1	Abutment Footing Hoops		11'-0	36	413	36	413	36	413	36	413	36	413	36	413	35	402	40	459	40	459
5s2	Abutment Footing Hoops		11'-3	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	7	45	7	45	7	45	7	45	7	45	7	45	8	52	9	58	9	58
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	21	28	21	28	21	28	21	28	21	27	21	27	24	31	27	35	27	35
	Reinforcing steel epoxy coated - total (lbs.)				2184		2184		2184		2184		2184		2184		2183		2251		2251

BILL OF REINFORCING STEEL - ONE ABUTMENT - 30° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		29'-6	7	551	7	551	7	551	7	551	7	551	7	551	7	551	7	551	7	551
8r2	Abutment Footing Longitudinal		24'-5	7	456	7	456	7	456	7	456	7	456	7	456	7	456	7	456	7	456
5s1	Abutment Footing Hoops		11'-0	42	482	42	482	42	482	42	482	42	482	42	482	42	482	40	459	40	459
5s2	Abutment Footing Hoops		11'-11	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	7	45	7	45	7	45	7	45	7	45	7	45	8	52	9	58	9	58
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	21	27	21	27	21	27	21	28	21	28	21	27	24	31	27	35	27	35
	Reinforcing steel epoxy coated - total (lbs.)				2342		2342		2342		2342		2342		2342		2352		2340		2340

BILL OF REINFORCING STEEL - ONE ABUTMENT - 45° Skew

Bridge Length				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
Mark	Location	Shape	Length	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight	No.	Weight
8r1	Abutment Footing Longitudinal		34'-8	7	648	7	648	7	648	7	648	7	648	7	648	7	648	7	648	7	648
8r2	Abutment Footing Longitudinal		29'-7	7	553	7	553	7	553	7	553	7	553	7	553	7	553	7	553	7	553
5s1	Abutment Footing Hoops		11'-0	56	642	56	642	56	642	56	642	56	642	56	642	56	642	56	642	54	620
5s2	Abutment Footing Hoops		13'-6	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56
6t1	Footing To Slab Bars		5'-0	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345	46	345
6t2	Footing To Slab Bars		5'-7	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386	46	386
#2	Pile Spiral		38'-6	9	58	9	58	9	58	9	58	9	58	9	58	9	58	9	58	10	64
	Spiral Spacers - L ⅞x⅞x⅛x 0.70		1'-10	27	35	27	35	27	35	27	35	27	35	27	35	27	35	27	35	30	39
	Reinforcing steel epoxy coated - total (lbs.)				2723		2723		2723		2723		2723		2723		2723		2723		2711

Note: The pile spirals and spiral spacers are to be non-coated reinforcing but may be epoxy-coated at the contractor's option and expense.

ESTIMATED QUANTITIES - ONE ABUT. - 0° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
Reinforcing Steel, Epoxy-Coated	lbs.	2132	2132	2132	2132	2153	2153	2153	2151	2128
Steel Piling HP 10x42	no.	6	6	6	6	7	7	7	8	9
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	80	90

ESTIMATED QUANTITIES - ONE ABUT. - 15° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9	14.9
Reinforcing Steel, Epoxy-Coated	lbs.	2184	2184	2184	2184	2184	2184	2183	2251	2251
Steel Piling HP 10x42	no.	7	7	7	7	7	7	8	9	9
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	90	90

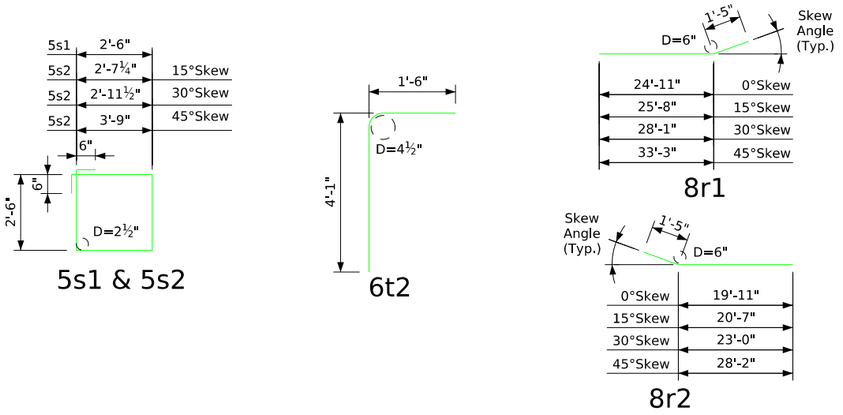
ESTIMATED QUANTITIES - ONE ABUT. - 30° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
Reinforcing Steel, Epoxy-Coated	lbs.	2342	2342	2342	2342	2342	2342	2352	2340	2340
Steel Piling HP 10x42	no.	7	7	7	7	7	7	8	9	9
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	90	90

ESTIMATED QUANTITIES - ONE ABUT. - 45° Skew

Location	Unit	Quantity								
Bridge Length		70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Structural Concrete (Bridge)	c.y.	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Reinforcing Steel, Epoxy-Coated	lbs.	2723	2723	2723	2723	2723	2723	2723	2723	2711
Steel Piling HP 10x42	no.	9	9	9	9	9	9	9	9	10
Prebored Holes	ft.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	90	100

BENT BAR DETAILS



Note: All Dimensions Are Out To Out. D=pin Diameter.

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

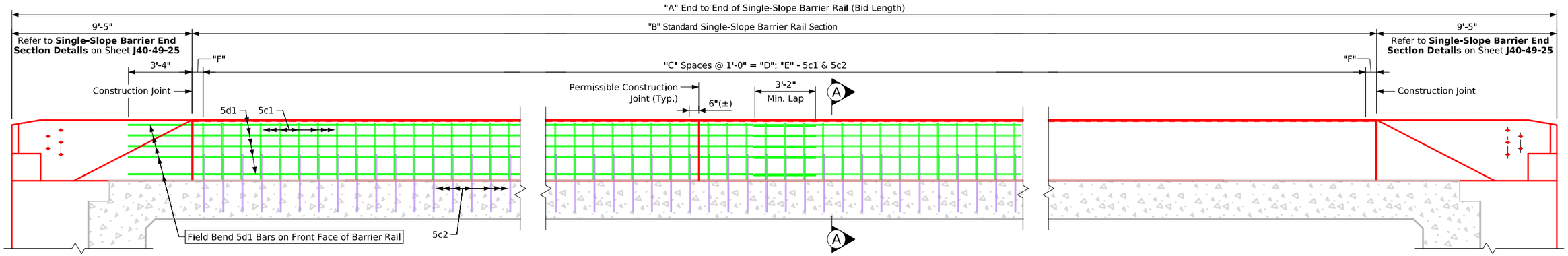
July, 2025

Abutment General Details – Steel Piling

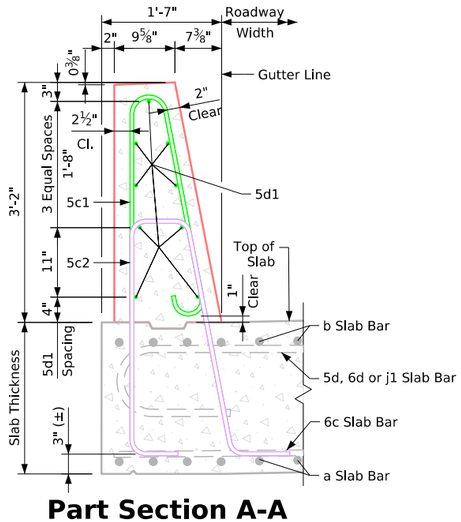
J40-46-25

Table of Single-Slope Barrier Rail Dimensions and Numbers

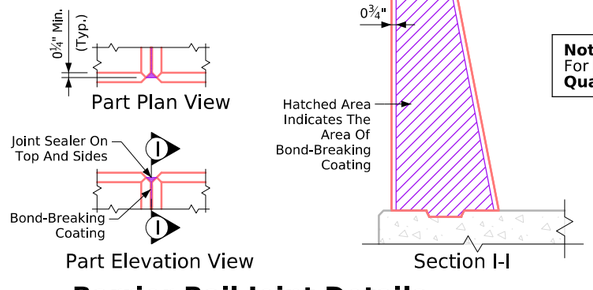
	Bridge Length	70'-0				80'-0				90'-0				100'-0				110'-0				120'-0				130'-0				140'-0				150'-0			
	Skew (Degrees)	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45
Dimension or Number	A (ft.-in.)	81'-0	81'-1¼	81'-5½	82'-3	91'-0	89'-1¼	91'-5½	92'-3	101'-0	101'-1¼	81'-5½	102'-3	111'-0	111'-1¼	111'-5½	112'-3	121'-0	121'-1¼	121'-5½	82'-3	131'-0	131'-1¼	131'-5½	132'-3	141'-0	141'-1¼	141'-5½	142'-3	151'-0	151'-1¼	151'-5½	152'-3	161'-0	161'-1¼	161'-5½	162'-3
	B (ft.-in.)	62'-2	62'-3¼	62'-7½	63'-5	72'-2	72'-3¼	72'-7½	73'-5	82'-2	82'-3¼	82'-7½	83'-5	92'-2	92'-3¼	92'-7½	93'-5	102'-2	102'-3¼	102'-7½	103'-5	112'-2	112'-3¼	112'-7½	113'-5	122'-2	122'-3¼	122'-7½	123'-5	132'-2	132'-3¼	132'-7½	133'-5	142'-2	142'-3¼	142'-7½	143'-5
	C	61	61	62	62	71	71	72	72	81	81	82	82	91	91	92	92	101	101	102	102	111	111	112	112	121	121	122	122	131	131	132	132	141	141	142	142
	D (ft.-in.)	61'-0	61'-0	62'-0	62'-0	71'-0	71'-0	72'-0	72'-0	81'-0	81'-0	82'-0	82'-0	91'-0	91'-0	92'-0	92'-0	101'-0	101'-0	102'-0	102'-0	111'-0	111'-0	112'-0	112'-0	121'-0	121'-0	122'-0	122'-0	131'-0	131'-0	132'-0	132'-0	141'-0	141'-0	142'-0	142'-0
	E	62	62	63	63	72	72	73	73	82	82	83	83	92	92	93	93	102	102	103	103	112	112	113	113	122	122	123	123	132	132	133	133	142	142	143	143
	F (in.)	7	7⅞	3¾	8½	7	7⅞	3¾	8½	7	7 5/8	3 3/4	8½	7	7⅞	3¾	8½	7	7⅞	3¾	8½	7	7⅞	3¾	8½	7	7⅞	3¾	8½	7	7⅞	3¾	8½	7	7⅞	3¾	8½



Elevation of Single-Sloped Barrier Rail



Part Section A-A



Barrier Rail Joint Details

Note:
For **Rail Single-Slope Barrier – Quantities** on Sheet **J40-48-25**.

Single-slope Barrier Rail Notes:

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

The permissible construction joints are to be placed between vertical bars at a minimum spacing of 20 feet. Construction joint contact surfaces are to be coated with an approved bond breaker.

Cost of the joint sealer and bond breaker shall be considered incidental to other construction.

The concrete single-sloped barrier rail is to be bid on a lineal foot basis. The number of lineal feet of barrier rail installed will be paid for at the contract price per lineal foot based on plan quantities. Price bid for **Concrete Barrier Rail** shall be full compensation for furnishing all material, excluding reinforcing steel, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications.

If conduit is required in this plan the rigid steel conduit, junction boxes and fittings including labor and any additional work to do the installation is considered incidental to the cost of the railing.

The joint sealer shall be light gray nonsag latex caulking sealer marketed for outdoor use. No testing or certification is required.

Top of the barrier rail is to be parallel to the theoretical centerline grade.

Cross sectional area of the standard section of the barrier rail = 3.5 square feet.

All Single-sloped barrier rail reinforcing steel is to be either epoxy coated or stainless steel as shown or noted. The stainless steel reinforcing steel shall be deformed bar Grade 60 meeting the requirements of **Materials I.M.452.**

Concrete Single-sloped barrier rails placed using the slipform method will require the use of a Class BR concrete in accordance with **Article 2513.03, A, 2, of the Standard Specification.** Cast-in-place barrier rails shall use **Class C mix**. Class D concrete is not permitted for concrete single-sloped barrier rails (cast-in-place or slipformed method).

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Rail Single-Slope Barrier – Details

J40-47-25

Revised 09-2026: Updated Bridge Engineer signature. Added 3'-4" dimension to horizontal barrier rail rebar into barrier end section.

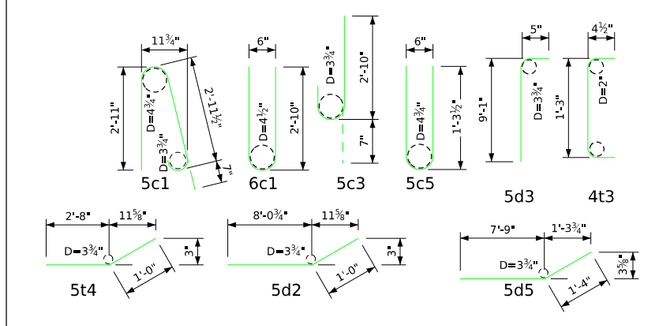
Epoxy Reinforcing Steel - Two Barrier Rails

Bridge Length				70'-0"			80'-0"			90'-0"			100'-0"			110'-0"			120'-0"			130'-0"			140'-0"			150'-0"		
Section	Bar	Location	Shape	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
2 Std.Sec	5c1	Vertical		124	6'-8"	862	144	6'-8"	1001	166	6'-8"	1154	186	6'-8"	1293	206	6'-8"	1432	226	6'-8"	1507	246	6'-8"	1640	266	6'-8"	1850	286	6'-8"	1989
	5d1	Long.		36	36'-6"	1371	54	28'-10"	1624	54	32'-1"	1807	54	35'-5"	1995	54	38'-9"	2182	72	32'-4"	2428	72	34'-10"	2616	72	37'-4"	2804	72	39'-10"	2991
4 End Sec.	6c1	Rail Vertical		48	5'-11"	427	48	5'-11"	427	48	5'-11"	427	48	5'-11"	427	48	5'-11"	427	48	5'-11"	427	48	5'-11"	427	48	5'-11"	427	48	5'-11"	427
	5c3	Rail Vertical (Traffic Face)		12	3'-5"	43	12	3'-5"	43	12	3'-5"	43	12	3'-5"	43	12	3'-5"	43	12	3'-5"	43	12	3'-5"	43	12	3'-5"	43	12	3'-5"	43
	5c5	Rail Vertical (End)		16	3'-1"	51	16	3'-1"	51	16	3'-1"	51	16	3'-1"	51	16	3'-1"	51	16	3'-1"	51	16	3'-1"	51	16	3'-1"	51	16	3'-1"	51
	5d1	Rail Horiz (Back Face)		24	9'-1"	227	24	9'-1"	227	24	9'-1"	227	24	9'-1"	227	24	9'-1"	227	24	9'-1"	227	24	9'-1"	227	24	9'-1"	227	24	9'-1"	227
	5d2	Rail Horiz (Traffic Face)		12	9'-1"	114	12	9'-1"	114	12	9'-1"	114	12	9'-1"	114	12	9'-1"	114	12	9'-1"	114	12	9'-1"	114	12	9'-1"	114	12	9'-1"	114
	5d3	Rail Horiz (Traffic Face)		12	9'-6"	120	12	9'-6"	120	12	9'-6"	120	12	9'-6"	120	12	9'-6"	120	12	9'-6"	120	12	9'-6"	120	12	9'-6"	120	12	9'-6"	120
	5d4	Rail Horiz (Traffic Face)		8	6'-3"	52	8	6'-3"	52	8	6'-3"	52	8	6'-3"	52	8	6'-3"	52	8	6'-3"	52	8	6'-3"	52	8	6'-3"	52	8	6'-3"	52
	5d5	Rail Horiz (Top)		8	9'-1"	76	8	9'-1"	76	8	9'-1"	76	8	9'-1"	76	8	9'-1"	76	8	9'-1"	76	8	9'-1"	76	8	9'-1"	76	8	9'-1"	76
	4t3	Rail Abut Wing Tie Bars		24	2'-0"	32		2'-0"	32	24	2'-0"	32	24	2'-0"	32	24	2'-0"	32	24	2'-0"	32	24	2'-0"	32	24	2'-0"	32	24	2'-0"	32
	5t4	Wing Horiz (Tie Bars)		8	3'-8"	31	8	3'-8"	31	8	3'-8"	31	8	3'-8"	31	8	3'-8"	31	8	3'-8"	31	8	3'-8"	31	8	3'-8"	31	8	3'-8"	31
		Epoxy Reinforced Total Weight (lbs)			Total	3406		Total	3798		Total	4134		Total	4461		Total	4787		Total	5108		Total	5429		Total	5827		Total	6153

Stainless Steel Reinforcing Steel - Two Barrier Rails

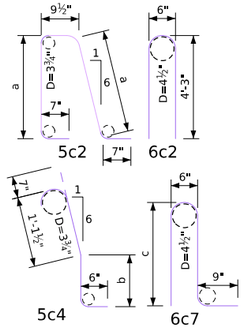
Bridge Length				70'-0"			80'-0"			90'-0"			100'-0"			110'-0"			120'-0"			130'-0"			140'-0"			150'-0"		
Section	Bar	Location	Shape	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
2 Std. Sec	5c2	Vertical		124	6'-8"	862	144	6'-9"	1014	166	6'-11"	1198	186	7'-2"	1390	206	7'-4"	1576	226	7'-7"	1788	246	7'-9"	1988	266	8'-0"	2220	286	8'-3"	2461
4 End Sec	6c2	Rail, Vertical		20	9'-0"	270	20	9'-0"	270	20	9'-0"	270	20	9'-0"	270	20	9'-0"	270	20	9'-0"	270	20	9'-0"	270	20	9'-0"	270	20	9'-0"	270
	5c4	Rail Vertical (Traffic Face)		24	3'-3"	81	24	3'-4"	83	24	3'-5"	86	24	3'-6"	88	24	3'-7"	90	24	3'-8"	92	24	3'-10"	96	24	3'-11"	98	24	4'-0"	100
	5c6	Rail , Vertical (End)		32	5'-8"	189	32	5'-8"	189	32	5'-8"	189	32	5'-8"	189	32	5'-8"	189	32	5'-8"	189	32	5'-8"	189	32	5'-8"	189	32	5'-8"	189
	6c7	Rail, Vertical (Slab/Abut.)		28	6'-3"	263	28	6'-5"	270	28	6'-7"	277	28	6'-9"	284	28	6'-11"	291	28	7'-2"	301	28	7'-5"	312	28	7'-7"	319	28	7'-10"	329
		Stainless Steel Reinforced Total Weight (lbs)			Total	1665		Total	1826		Total	2020		Total	2221		Total	2416		Total	2640		Total	2855		Total	3096		Total	3349

Epoxy Bent Bar Details



Note: All Dimensions Are Out To Out. D = Pin Diameter.

Stainless Bent Bar Details



Bridge	5c2 a	5c2 Length	5c4 b	5c4 Length	6c7 c	6c7 Length
70'-0"	2'-4"	6'-8"	1'-0"	3'-3"	2'-6"	6'-3"
80'-0"	2'-4¾"	6'-9"	1'-0¾"	3'-4"	2'-6¾"	6'-5"
90'-0"	2'-5¾"	6'-11"	1'-1¾"	3'-5"	2'-7¾"	6'-7"
100'-0"	2'-7"	7'-2"	1'-3"	3'-6"	2'-9"	6'-9"
110'-0"	2'-8"	7'-4"	1'-4"	3'-7"	2'-10"	6'-11"
120'-0"	2'-9½"	7'-7"	1'-5½"	3'-8"	2'-11½"	7'-2"
130'-0"	2'-10¾"	7'-9"	1'-6¾"	3'-10"	3'-0¾"	7'-5"
140'-0"	3'-0"	8'-0"	1'-8"	3'-11"	3'-2"	7'-7"
150'-0"	3'-1½"	8'-3"	1'-9½"	4'-0"	3'-3½"	7'-10"

Note: All Dimensions Are Out To Out. D = Pin Diameter.

Concrete Placement Summary

Bridge Length	70'-0"	80'-0"	90'-0"	100'-0"	110'-0"	120'-0"	130'-0"	140'-0"	150'-0"
Standard Section ✱ 2 x "B" @ 0.1301 cu.yd. per ft.	8.2	9.6	10.9	12.2	13.5	14.8	16.1	17.4	18.7
End Section 4 @ 1.00 cu.yd.					4.0				
Total (cu.yd.)	12.2	13.6	14.9	16.2	17.5	18.8	20.1	21.4	22.7

✱ For Rail Single-Slope Barrier – **Dimension "B"**, see **J40-47-25**
Concrete Quantities shown are based on 45° skew bld lengths.

Concrete Barrier Rail Quantities

Bridge Length		Unit	70'-0"	80'-0"	90'-0"	100'-0"	110'-0"	120'-0"	130'-0"	140'-0"	150'-0"
Concrete Barrier Railing	0° Skew	L.F.	162.0	182.0	202.0	222.0	242.0	262.0	282.0	302.0	322.0
Concrete Barrier Railing	15° Skew	L.F.	162.2	182.2	202.2	222.2	242.2	262.2	282.2	302.2	322.2
Concrete Barrier Railing	30° Skew	L.F.	162.9	182.9	202.9	222.9	242.9	262.9	282.9	302.9	322.9
Concrete Barrier Railing	45° Skew	L.F.	164.5	184.5	204.5	224.5	244.5	264.5	284.5	304.5	324.5

Note:
For **Rail Single-Slope Barrier – Details**, see Sheet **J40-47-25.**

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

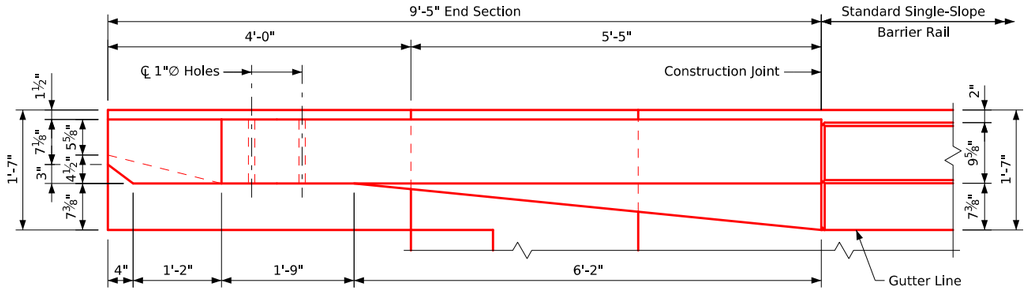
Continuous Concrete Slab Bridge

July, 2025

Rail Single-Slope Barrier – Quantities

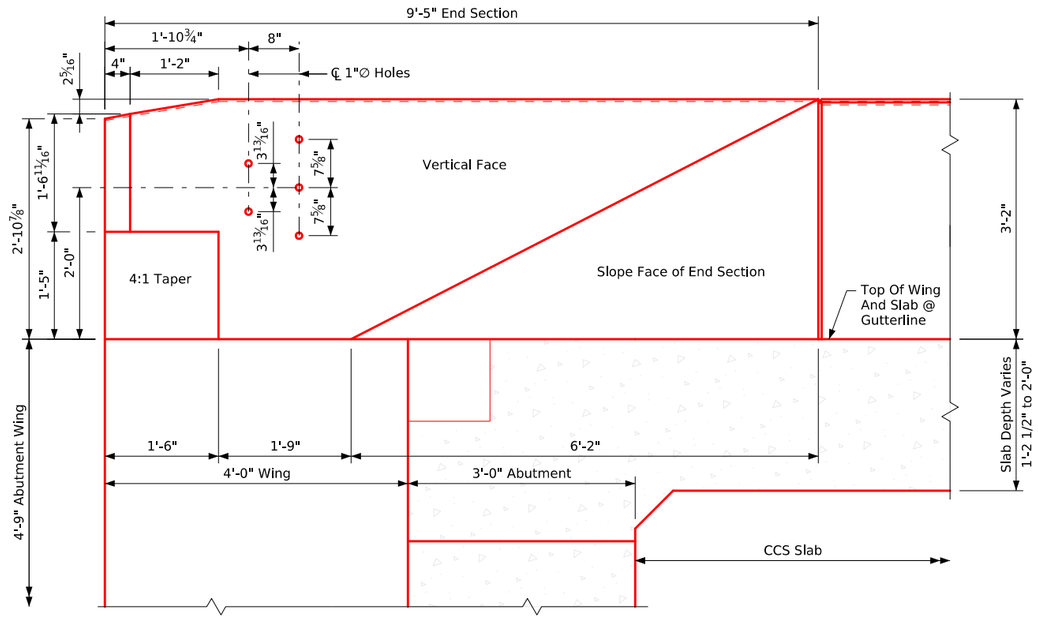
J40-48-25

Revised 09-2026: Updated Bridge Engineer signature. Added "Unit" column to the "Concrete Barrier Rail Quantities" table.

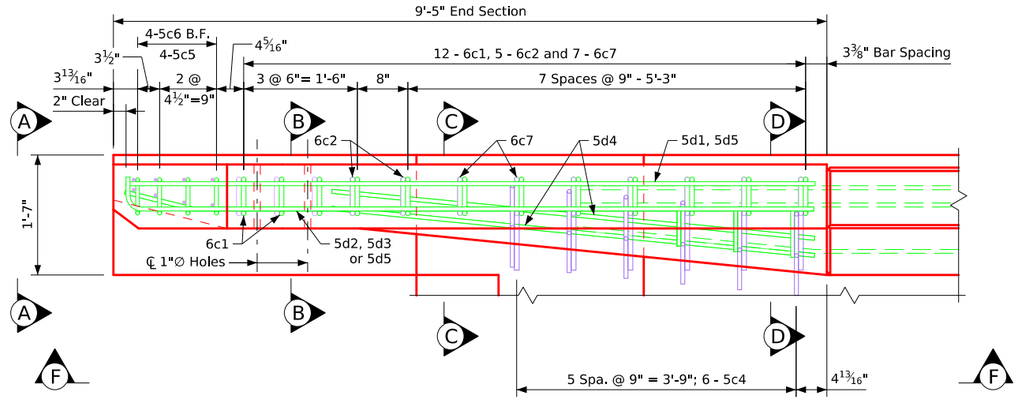


Part Plan View

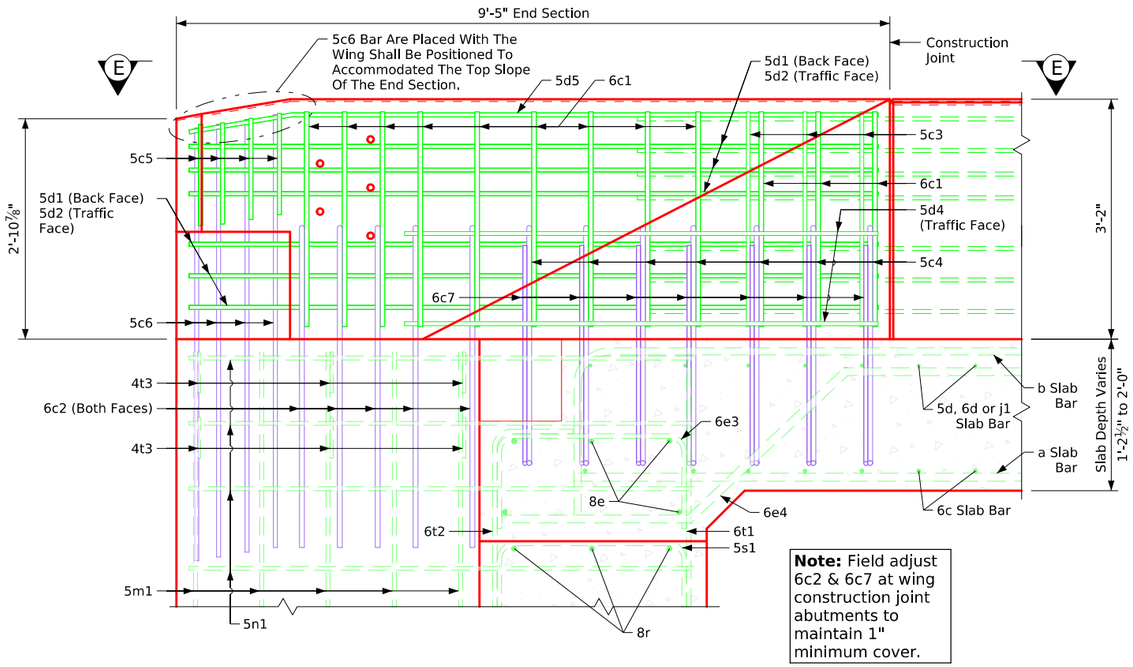
Provide five holes formed with 1" diameter plastic conduit.
Cost to be included in price of Bid for **Concrete Barrier Rail**.



Part Elevation View



Part View E-E



Note: Field adjust 6c2 & 6c7 at wing construction joint abutments to maintain 1" minimum cover.

Part View F-F

Note: 4t3 placement: Six bars each at the top two rows of the 5n1 bars in the abutment wing to provide construction tie locations for vertical barrier bars.

Construction joint between the top of the abutment wing and the single-slope barrier rail is roughened concrete.

6c2, 5c4, 5c6, 6c7, 5t4 and 4t3 bars are to be placed with the abutment wing.

Dashed lines below the top of the wing indicate abutment wing and slab reinforcing steel. For additional details, see Sheet **J40-20-25**.

Note:
For section details, see Sheet **J40-50-25**

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

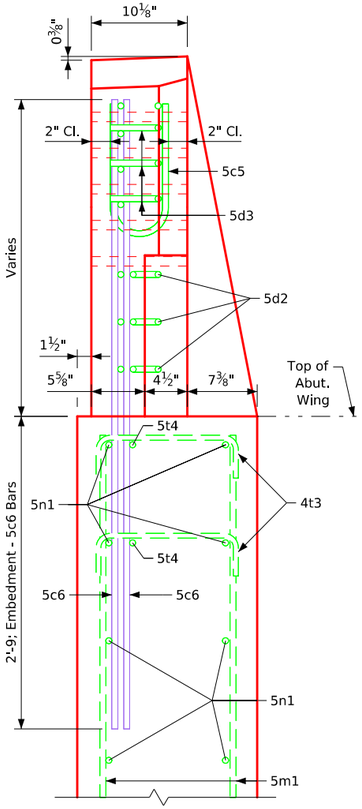
Continuous Concrete Slab Bridge

July, 2025

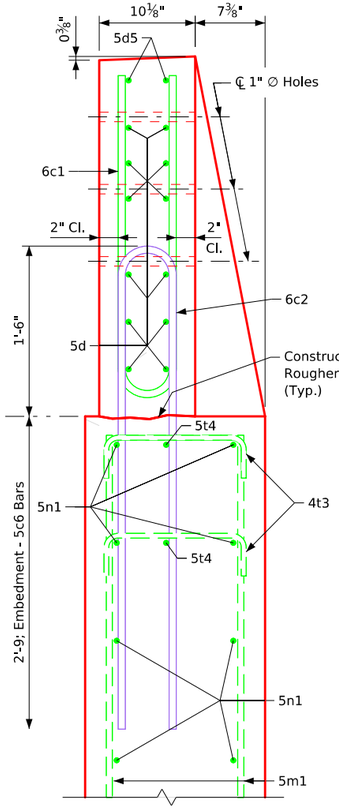
Rail Single-Slope Barrier – End Section Details (1 of 2)

J40-49-25

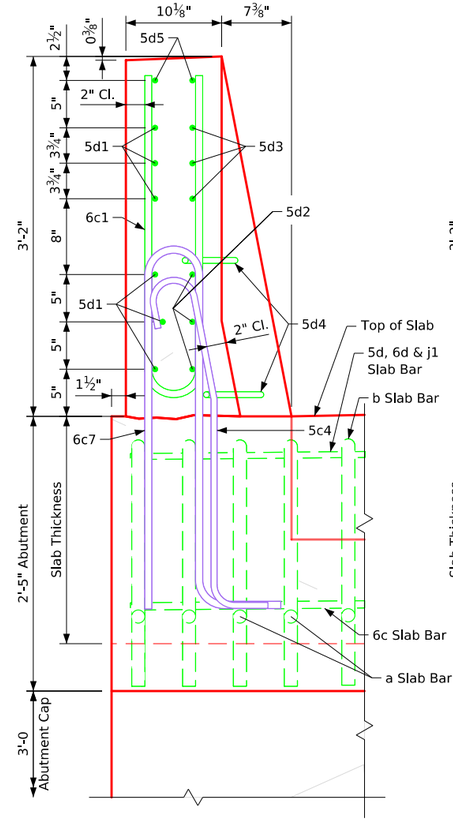
Revised 09-2026: Updated Bridge Engineer signature.



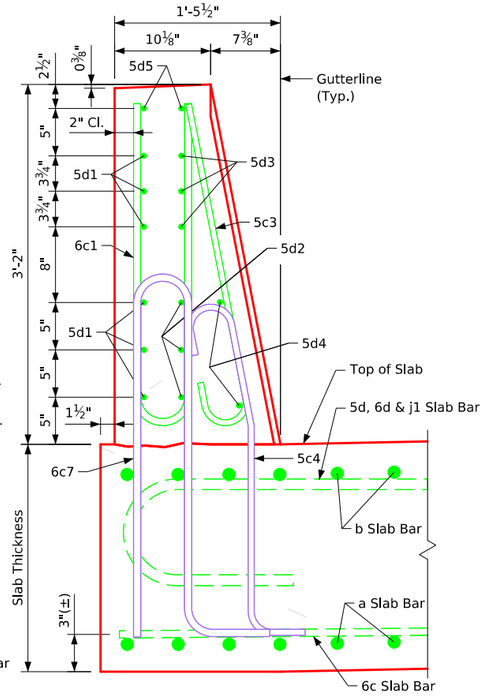
View A-A



Section B-B



Section C-C



Section D-D

Note: For End Section locations, see Sheet **J40-49-25.**

Note: For barrier rail end section quantities, see Sheet **J40-48-25.**

Note: For additional barrier-to-abutment wing details, see Sheet **J40-20-25.**

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Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Rail Single-Slope Barrier – End Section Details (2 of 2)

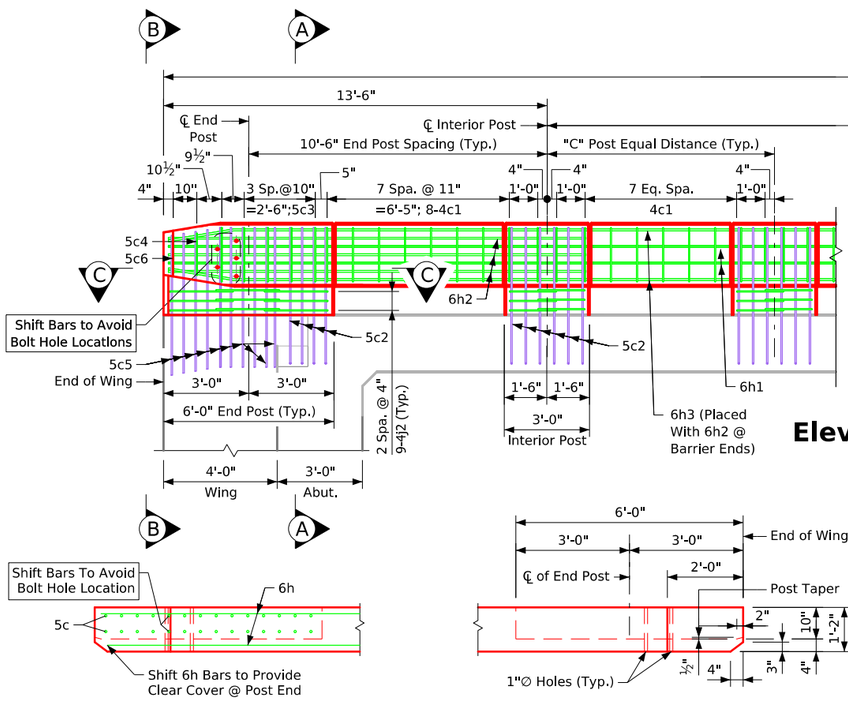
J40-50-25

Revised 09-2026: Updated Bridge Engineer signature.

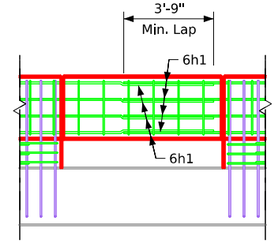
Table of Open Rail Dimensions and Numbers

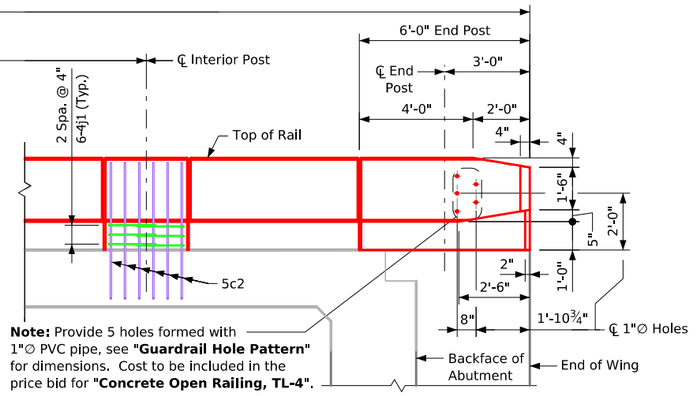
Bridge Length		70'-0"				80'-0"				90'-0"				100'-0"				110'-0"				120'-0"				130'-0"				140'-0"				150'-0"			
Skew		0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45
Dim. or Number	A(ft.-in.)	81'-0"	81'-1¼"	81'-5½"	82'-3"	91'-0"	91'-1¼"	91'-5½"	92'-3"	101'-0"	101'-1¼"	101'-5½"	102'-3"	111'-0"	111'-1¼"	111'-5½"	112'-3"	121'-0"	121'-1¼"	121'-5½"	122'-3"	131'-0"	131'-1¼"	131'-5½"	132'-3"	141'-0"	141'-1¼"	141'-5½"	142'-3"	151'-0"	151'-1¼"	151'-5½"	152'-3"	161'-0"	161'-1¼"	161'-5½"	162'-3"
	B	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	16
	C(ft.-in.)	7'-8⅜"	7'-8¾"	7'-9⅜"	7'-10¾"	8'-0"	8'-0⅜"	8'-0¾"	8'-1⅜"	8'-2⅜"	8'-2¾"	8'-3¼"	8'-4⅜"	8'-4¾"	8'-4⅞"	8'-5⅜"	8'-6¼"	8'-6½"	8'-6⅞"	8'-7"	8'-7⅞"	8'-8"	8'-8⅜"	8'-8½"	8'-9¼"	8'-9¼"	8'-9⅜"	8'-9⅜"	8'-10⅜"	8'-10¼"	8'-10⅜"	8'-10⅝"	8'-11⅜"	8'-11⅛"	8'-11¼"	8'-11⅜"	8'-5⅜"

Note:
For **Rail Open Barrier – Quantities**, see Sheet **J40-52-25.**

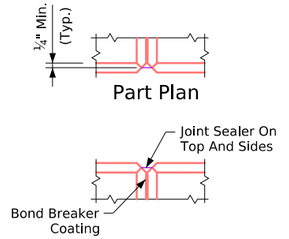


Elevation of Open Barrier Rail





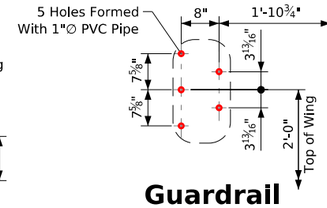
Note: Provide 5 holes formed with 1"∅ PVC pipe, see **"Guardrail Hole Pattern"** for dimensions. Cost to be included in the price bid for **"Concrete Open Railing, TL-4"**.



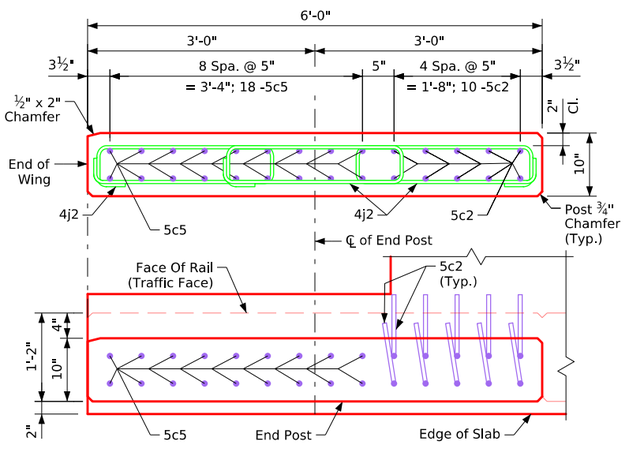
Joint Details at End Section

Section C-C

Part Plan of End Post

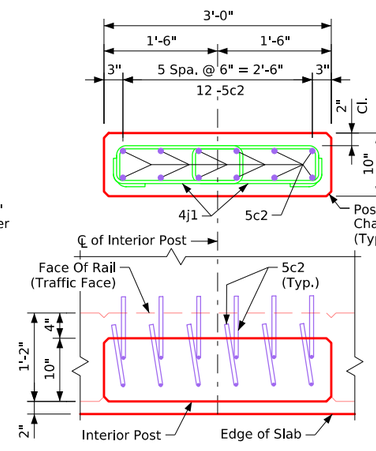


Guardrail Hole Pattern



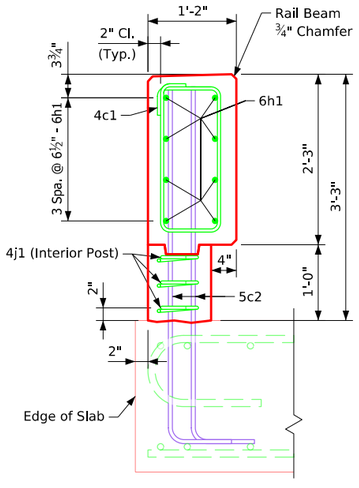
End Post Details

(Shift 5c2 At Wing Construction Joint To Provide 1" Clearance.)



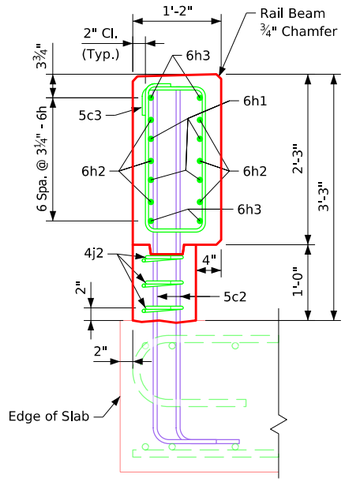
Interior Post Details

(Typical)



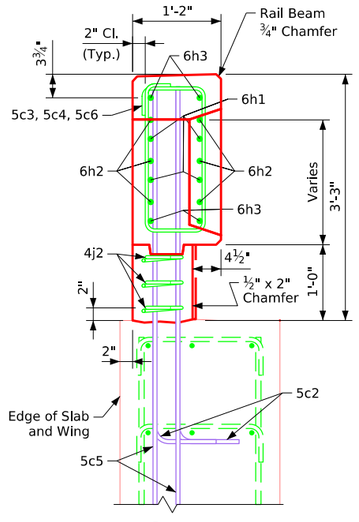
(Typical) Rail Section

(At Interior Post)



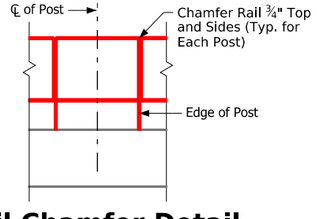
Part Section A-A

(At End Post)



View B-B

(At End Post)



Rail Chamfer Detail

09-2026 Latest Revision Date	IOWA DOT
Approved by Bridge Engineer	Standard Design-40'-0" Roadway, 3 Span Bridge
	Continuous Concrete Slab Bridge
	July, 2025
	Rail Open Barrier – Details
	J40-51-25

Revised 09-2026: Updated Bridge Engineer signature.

Epoxy Reinforcing Steel - Two Barrier Rails

Bridge Length			70'-0"			80'-0"			90'-0"			100'-0"			110'-0"			120'-0"			130'-0"			140'-0"			150'-0"		
Bar	Location	Shape	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
4c1	Rail Ties		176	6'-3"	735	196	6'-3"	818	216	6'-3"	902	236	6'-3"	985	256	6'-3"	1069	276	6'-3"	1152	296	6'-3"	1236	316	6'-3"	1319	336	6'-3"	1403
5c3	End Posts, Tie		20	6'-6"	136	20	6'-6"	136	20	6'-6"	136	20	6'-6"	136	20	6'-6"	136	20	6'-6"	136	20	6'-6"	136	20	6'-6"	136	20	6'-6"	136
5c4	End Post, Tie		4	6'-2"	26	4	6'-2"	26	4	6'-2"	26	4	6'-2"	26	4	6'-2"	26	4	6'-2"	26	4	6'-2"	26	4	6'-2"	26	4	6'-2"	26
5c6	End Post, Tie		4	5'-2"	22	4	5'-2"	22	4	5'-2"	22	4	5'-2"	22	4	5'-2"	22	4	5'-2"	22	4	5'-2"	22	4	5'-2"	22	4	5'-2"	22
6h1	Rail , Horizontal		32	29'-11"	1438	32	33'-3"	1598	32	36'-7"	1758	32	39'-11"	1919	48	33'-5"	2409	48	35'-11"	2589	48	38'-5"	2770	64	33'-5"	3212	64	35'-6"	3412
6h2	Rail, Horizontal, Ends		24	14'-10"	535	24	14'-10"	535	24	14'-10"	535	24	14'-10"	535	24	14'-10"	535	24	14'-10"	535	24	14'-10"	535	24	14'-10"	535	24	14'-10"	535
6h3	Rail, Horizontal, Ends		16	29'-11"	719	16	33'-3"	799	16	36'-7"	879	16	39'-11"	959	16	33'-5"	803	16	35'-11"	862	16	38'-5"	923	16	33'-5"	803	16	35'-6"	853
4j1	Interior Post, Tie		96	4'-9"	305	108	4'-9"	343	120	4'-9"	381	132	4'-9"	419	144	4'-9"	457	156	4'-9"	495	168	4'-9"	533	180	4'-9"	571	192	4'-9"	609
4j2	End Post, Tie		36	6'-3"	150	36	6'-3"	150	36	6'-3"	150	36	6'-3"	150	36	6'-3"	150	36	6'-3"	150	36	6'-3"	150	36	6'-3"	150	36	6'-3"	150
Total (lbs)					4066			4427			4789			5151			5607			5967			6331			6774			7146

Note: Reinforcing quantities shown are based on 45 degree skew bid lengths.

Stainless Steel Reinforcing Steel - Two Barrier Rails

Bridge Length			70'-0"			80'-0"			90'-0"			100'-0"			110'-0"			120'-0"			130'-0"			140'-0"			150'-0"		
Bar	Location	Shape	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight
5c2	Posts, Vertical		232	4'-11"	1190	256	5'-0"	1335	280	5'-1"	1485	304	5'-2"	1638	328	5'-3"	1796	352	5'-5"	1989	376	5'-6"	2157	400	5'-7"	2329	424	5'-9"	2543
5c5	End Posts, Vertical		72	5'-1"	382	72	5'-1"	382	72	5'-1"	382	72	5'-1"	382	72	5'-1"	382	72	5'-1"	382	72	5'-1"	382	72	5'-1"	382	72	5'-1"	382
Total (lbs)					1572			1717			1867			2020			2178			2371			2539			2711			2925

Concrete Placement Quantities

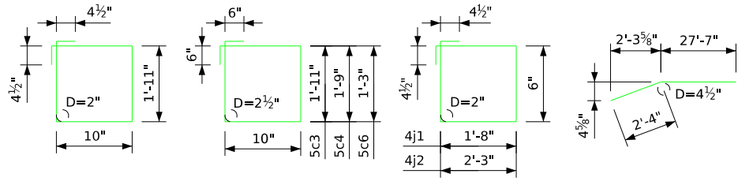
Bridge Length	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
One Rail Qtys (cu. yd.)	8.0	9.0	9.9	10.9	11.9	12.9	13.8	14.8	15.8
Quant Interior Posts (One Rail)	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6
Quantity Two End Posts	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total Conc. Qtys -Two Rails (cu. yd.)	18.2	20.3	22.5	24.6	26.7	28.9	31.0	33.1	35.4

Note: Concrete quantities shown are based on 45 degree skew bid lengths.

Concrete Open Rail Quantites

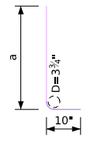
Bridge Length	Unit	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
Concrete Open Railing TL-4 0 deg skew	L.F.	162.0	182.0	202.0	222.0	242.0	262.0	282.0	302.0	322.0
Concrete Open Railing TL-4 15 deg skew	L.F.	162.2	182.2	202.2	222.2	242.2	262.2	282.2	302.2	322.2
Concrete Open Railing TL-4 30 deg skew	L.F.	162.9	182.9	202.9	222.9	242.9	262.9	282.9	302.9	322.9
Concrete Open Railing TL-4 45 deg skew	L.F.	164.5	184.5	204.5	224.5	244.5	264.5	284.5	304.5	324.5

Epoxy Bent Bar Details



Note: All Dimensions Are Out To Out. D = Pin Diameter.

Stainless Bent Bar Details



Bridge	Slab Depth	a Dim.	Bar Length
70'-0"	1'-2 1/2"	4'-1"	4'-11"
80'-0"	1'-3 1/4"	4'-1 3/4"	5'-0"
90'-0"	1'-4 1/4"	4'-2 3/4"	5'-1"
100'-0"	1'-5 1/2"	4'-4"	5'-2"
110'-0"	1'-6 1/2"	4'-5"	5'-3"
120'-0"	1'-8"	4'-6 1/2"	5'-5"
130'-0"	1'-9 1/4"	4'-7 3/4"	5'-6"
140'-0"	1'-10 1/2"	4'-9"	5'-7"
150'-0"	2'-0"	4'-10 1/2"	5'-9"

Note: All Dimensions Are Out To Out. D = Pin Diameter.

Open Rail Notes:

The open rail system meets **Test Level 4 (TL-4)** requirements according to the **Manual for Assessing Safety Hardware (MASH)** and includes provisions for a 3" future wearing surface height.

All barrier rail reinforcing steel is to be either epoxy-coated or stainless steel, as shown or noted. Stainless steel reinforcing steel shall be deformed bar, Grade 60, meeting the requirements of **Materials I.M. 452**.

Unless otherwise noted or shown, the minimum clear distance from the face of concrete to the nearest reinforcing bar shall be 2".

The cost of the joint sealer and bond breaker shall be considered incidental to the price bid item "**Concrete Open Rail, TL-4**."

The concrete open rail is to be bid on a linear foot basis, measured from end to end of the rail. The number of linear feet of open rail installed will be paid for at the contract price per linear foot.

The price bid for "**Concrete Open Rail, TL-4**" shall be full compensation for furnishing all materials (excluding reinforcing steel) and for all equipment and labor required to construct the rail in accordance with these plans and current specifications.

All open rail concrete is to be **Class C**.

The joint sealer shall be a light gray, non-sag latex caulking sealer marketed for outdoor use. No testing or certification is required.

The top of the open rail shall be parallel to the theoretical ℄ grade.

Note:
For **Rail Open Barrier - Details**, see Sheet **J40-51-25**.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

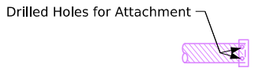
Continuous Concrete Slab Bridge

July, 2025

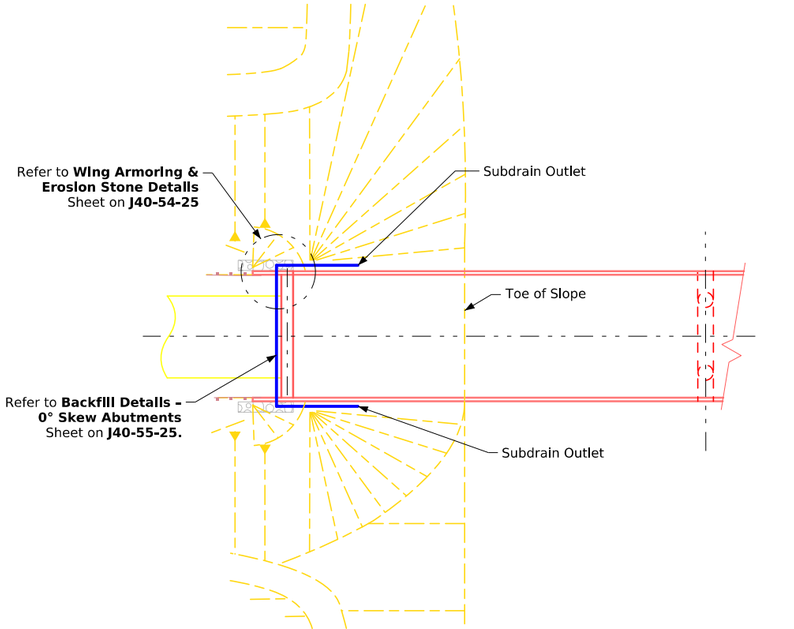
Rail Open Barrier – Quantities

J40-52-25

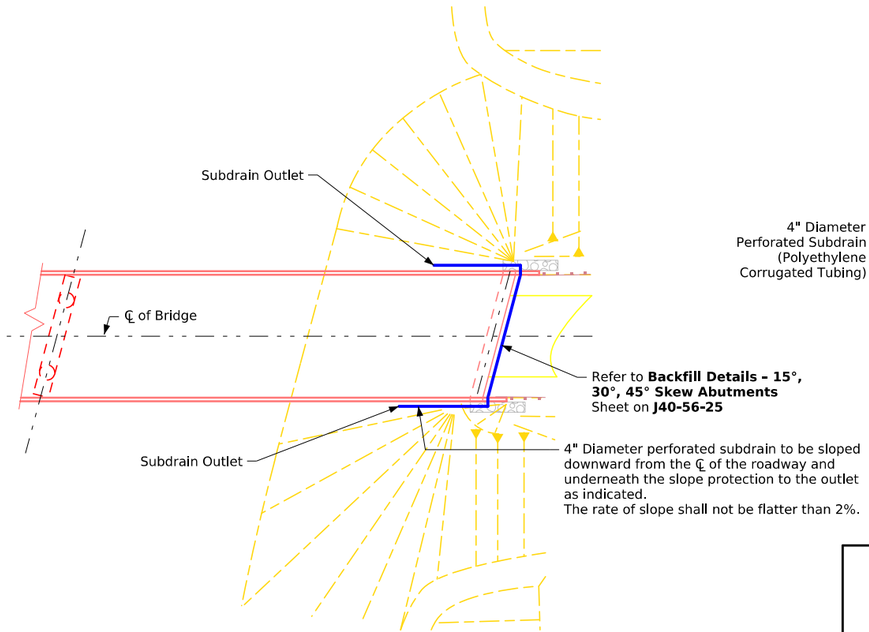
Revised 09-2026: Updated Bridge Engineer signature.



Removable Rodent Guard Details



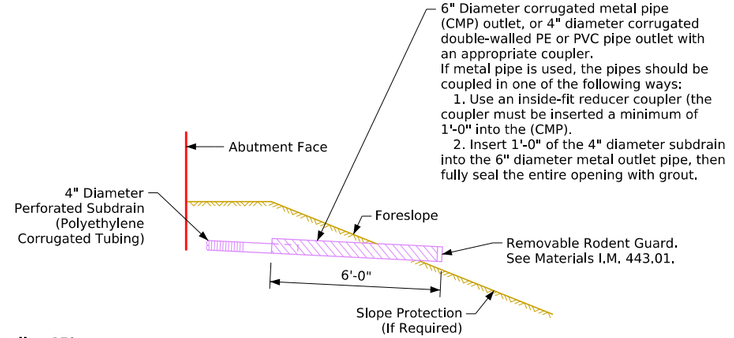
Protection Layout
0 Degree Skew



Protection Layout
Skewed

Situation Plan

Refer to **Situation Plan** for North arrow.



Typical Subdrain Outlet Details

09-2026 Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

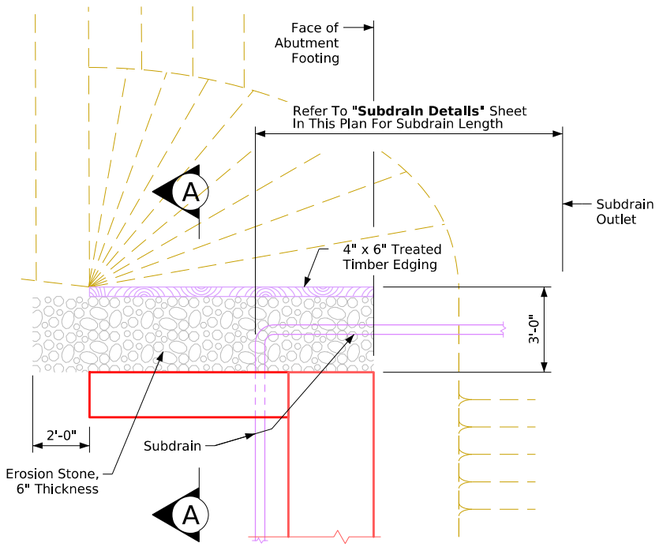
Continuous Concrete Slab Bridge

July, 2025

Subdrain Details

J40-53-25

Revised 09-2026: Updated Bridge Engineer signature. Updated sheet to use Erosion Stone (was using Macadam Stone).



Plan View of Wing Armoring

Erosion Stone Wing Armoring Notes:

Macadam stone shall be placed along the side of the wing and abutment footing, typically at each corner of the bridge unless otherwise noted in the plans. This erosion stone shall be underlaid with engineering fabric and comply with **Article 4196.01, B, 3, of the Standard Specifications.**

The bridge berm foreslope shall be compacted and shaped as shown on these plans, the Situation Plan, and as directed by the Engineer. The berm foreslope shall be firm when the engineering fabric and erosion stone are placed.

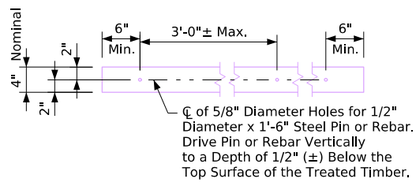
The engineering fabric shall meet the requirements of **Article 4196.01, B, 3, of the Standard Specifications**. If the fabric is lapped, the laps shall be a minimum of one foot in length, placed in shingle fashion with the upslope lap piece on top and stapled for continuity.

The erosion stone shall comply with **Article 4122.02 of the Standard Specifications** for coarse material (no choke stone allowed).

The wood preservative treatment for the timber edging shall meet the requirements for guardrail posts, sawed four sides, and comply with **Section 4161 of the Standard Specifications.**

The erosion stone shall be deposited, spread, consolidated, and shaped by mechanical or hand methods to provide uniform depth, density, and surface appearance.

Payment for the bridge wing armoring shall be incidental to the price bid item "**Structural Concrete (Bridge)**" and shall include all material and labor costs to construct the wing armoring as shown in these plans.



4" x 6" Treated Timber Edging Details

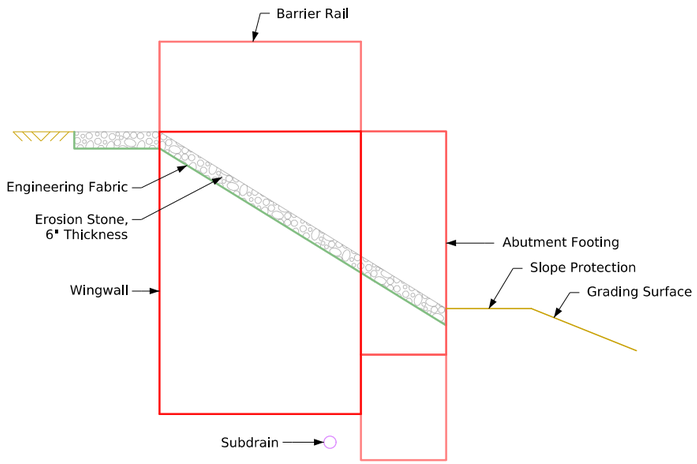
Subdrain Notes:

For details on placing all subdrains and subdrain outlets required for this structure, see **Subdrain Details** on sheet **J44-54-25** and "**Situation Plan**"

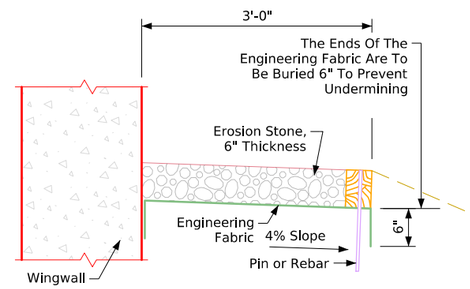
The Bridge Contractor is responsible for installing subdrains behind the abutment. The subdrains shall be 4" in diameter and comply with **Article 4143.01, B, of the Standard Specifications**. The subdrain outlet shall consist of a 6'-0" length of pipe with a removable rodent guard.

The dimensions shown for the proposed subdrains are based on the grading layout of the bridge berms. These dimensions are for estimating purposes only. Required lengths and general locations of subdrains may change due to field adjustments to the grading layout.

The cost for furnishing and placing the subdrain (including excavation), granular backfill, porous backfill, and subdrain outlet is to be included in the price bid for "**Structural Concrete (Bridge)**." No additional payment will be made.



Elevation View of Wing Armoring



Section A-A

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

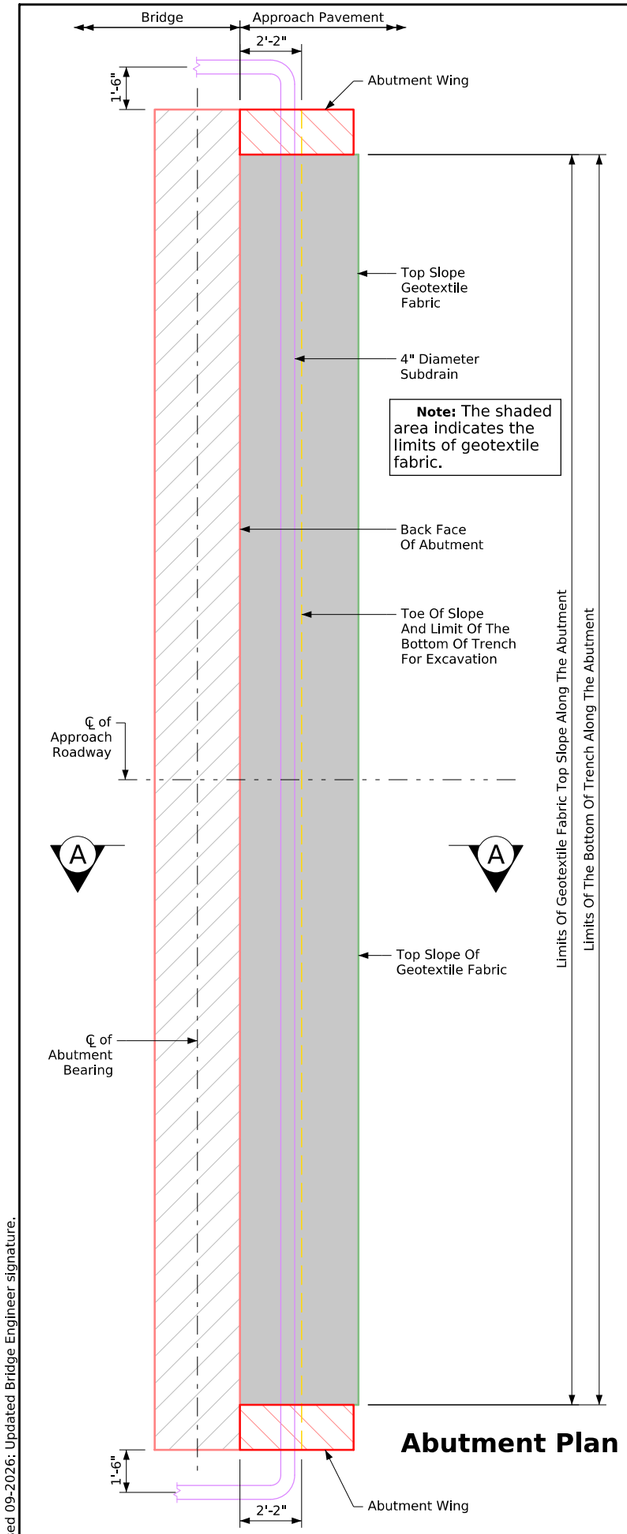
Continuous Concrete Slab Bridge

July, 2025

Wing Protection &
Erosion Stone Details

J40-54-25

Revised 09-2026: Updated Bridge Engineer signature. Updated sheet to use Erosion Stone (was using Macadam Stone).



Abutment Plan

Abutment Backfill Process:

The base of the excavation subgrade behind the abutment shall be graded with a 4% slope away from the abutment footing and a 2% cross slope towards the subdrain outlet. This grading should be completed before the installation of the geotextile and backfill material.

Once the subgrade is shaped, the geotextile fabric shall be installed according to the details shown. The fabric is to be placed at the base of the excavation and extended vertically up the abutment backwall, wing walls, and excavation face, reaching a height approximately 1 to 2 feet higher than the porous backfill, as shown in the "Backfill Details" on this sheet. The fabric strips should overlap by about 1 foot and be pinned in place. The fabric should be attached to the abutment using lath folded into the fabric and secured with shallow concrete nails. The fabric against the excavation face must also be pinned.

After the fabric is installed, the subdrain shall be placed directly on it at the toe of the rear excavation slope. A slot should be cut in the fabric where the subdrain exits near the end of the abutment wing wall.

Porous backfill shall be placed and leveled without compaction.

Next, floodable backfill shall be used, followed by surface flooding and vibratory compaction. The floodable backfill material must conform to the Standard Specifications. It should be placed in lifts, surface flooded, and compacted with vibratory compaction to ensure full consolidation, with a maximum loose lift thickness of 2 feet.

Surface flooding for each lift should start at the high point of the subdrain and proceed to the low point where the subdrain exits the fabric. Water should be applied through a 2-inch diameter hose, sprayed in 6-foot to 8-foot increments for 3 minutes per increment to ensure uniform flooding.

The placement of floodable backfill, flooding, and compaction should continue until the full thickness of the abutment backfill is completed.

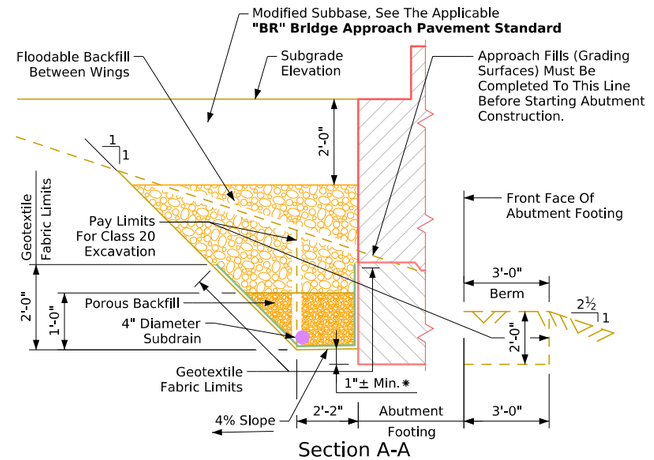
Water used for flooding, subdrains, porous backfill, floodable backfill, and geotextile fabric at the bridge abutments will not be measured separately for payment. The cost of this water shall be included in the contract unit price bid for **"Structural Concrete (Bridge)"**.

Note:

Subdrain shall slope downward 2% from centerline approach roadway when outletting both sides of the abutment.

Subdrain shall slope downward 2% from high end when outletting at one end of the abutment.

The geotextile fabric shall be in accordance with **Article 4196.01, B, 6 of the Standard Specifications.** If the engineering fabric is lapped the laps shall be a minimum of one foot in length, shingle fashion with up slope lap piece on top and stapled for continuity.



Section A-A

Backfill Details

Note: Geotextile fabric shall be attached to the face of the abutment footing and wings.

* Dimension varies due to the 2% subdrain slope.

Note: For additional details not shown on this sheet, see **Subdrain Details** on Sheet **J40-53-25**.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

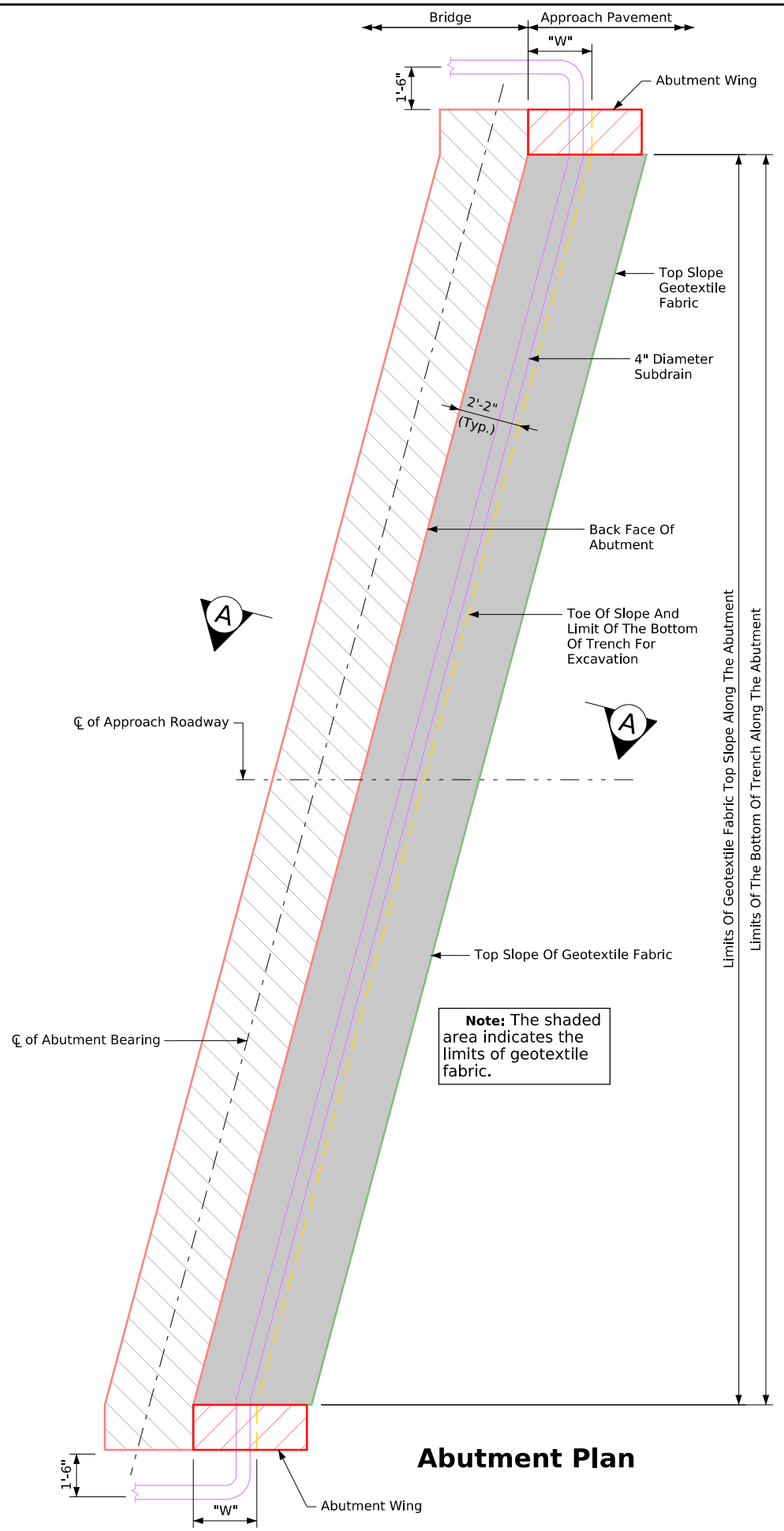
Continuous Concrete Slab Bridge

July, 2025

Backfill Details – 0° Skew Abutments

J40-55-25

Revised 09-2026: Updated Bridge Engineer signature.



Abutment Plan

Abutment Backfill Process:

The base of the excavation subgrade behind the abutment shall be graded with a 4% slope away from the abutment footing and a 2% cross slope towards the subdrain outlet. This grading should be completed before the installation of the geotextile and backfill material.

Once the subgrade is shaped, the geotextile fabric shall be installed according to the details shown. The fabric is to be placed at the base of the excavation and extended vertically up the abutment backwall, wing walls, and excavation face, reaching a height approximately 1 to 2 feet higher than the porous backfill, as shown in the "Backfill Details" on this sheet. The fabric strips should overlap by about 1 foot and be pinned in place. The fabric should be attached to the abutment using lath folded into the fabric and secured with shallow concrete nails. The fabric against the excavation face must also be pinned.

After the fabric is installed, the subdrain shall be placed directly on it at the toe of the rear excavation slope. A slot should be cut in the fabric where the subdrain exits near the end of the abutment wing wall.

Porous backfill shall be placed and leveled without compaction.

Next, floodable backfill shall be used, followed by surface flooding and vibratory compaction. The floodable backfill material must conform to the Standard Specifications. It should be placed in lifts, surface flooded, and compacted with vibratory compaction to ensure full consolidation, with a maximum loose lift thickness of 2 feet.

Surface flooding for each lift should start at the high point of the subdrain and proceed to the low point where the subdrain exits the fabric. Water should be applied through a 2-inch diameter hose, sprayed in 6-foot to 8-foot increments for 3 minutes per increment to ensure uniform flooding.

The placement of floodable backfill, flooding, and compaction should continue until the full thickness of the abutment backfill is completed.

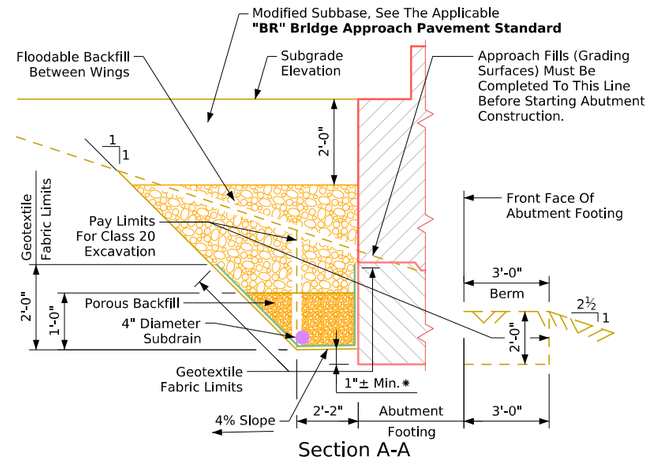
Water used for flooding, subdrains, porous backfill, floodable backfill, and geotextile fabric at the bridge abutments will not be measured separately for payment. The cost of this water shall be included in the contract unit price bid for **"Structural Concrete (Bridge)"**.

Note:

Subdrain shall slope downward 2% from centerline approach roadway when outletting both sides of the abutment.

Subdrain shall slope downward 2% from high end when outletting at one end of the abutment.

The geotextile fabric shall be in accordance with **Article 4196.01, B, 6 of the Standard Specifications.** If the engineering fabric is lapped the laps shall be a minimum of one foot in length, shingle fashion with up slope lap piece on top and stapled for continuity.



Section A-A

Backfill Details

Note: Geotextile fabric shall be attached to the face of the abutment footing and wings.

* Dimension varies due to the 2% subdrain slope.

"W" Dimension	
Skew	Dimension
15 Degree	2'-2⅞"
30 Degree	2'-6"
45 Degree	3'-0¾"

Note: For additional details not shown on this sheet, see **Subdrain Details** on Sheet **J40-53-25**.

09-2026
Latest Revision Date

Approved by Bridge Engineer

IOWA DOT

Standard Design-40'-0" Roadway, 3 Span Bridge

Continuous Concrete Slab Bridge

July, 2025

Backfill Details – 15°, 30°, 45° Skew Abutments

J40-56-25

Revised 09-2026: Updated Bridge Engineer signature.