

Presentation Outline

- BSB Personnel Updates
- 3D/DD/BIM Efforts
- PPCB Update
- Decks
- Drains
- BE Joint
- Paddling Routes
- Foundation Interference
- Narrow Bridges
- Inundation

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- Debris Containment Systems
- Bridge Rail Guide
- Settlement and Downdrag
 Drilled Shaft No Rock Socket
- ABC Lateral Slides
- Deck Cracking
- E5
- UHPC Overlays
- PPC Overlays
- Concrete Removal





BSB BIM/3D/DD Efforts

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Digital Delivery of CADD Files

- CADD files are complex. No longer simple 2D drawings.
- BSB is getting more requests for digital CADD files after letting. •
- Currently, providing digital CADD files after letting is seen as a courtesy. . BSB will typically provide digital CADD files when requested, but reserves the
- right to refuse requests. Digital CADD files are provided "as-is". They are non-contract documents.
- The DOT and its consultants have no liability for any errors or omissions for . non-contract documents.
- Currently BSB does not want to provide support after letting.
- BSB will be developing a workflow to provide digital CADD files as part of the standard non-contract deliverables. Use 3D FY2026 pilot projects as part of this effort.

Digital Delivery for Rebar	I SWA DOT
Digital delivery effort includes adopting a (industry) standard for reinforcement bending diagrams – shapes and tags.	Vis. CENTRAL - TYPICAL EEDS Morch 2020 Vis. C
aSa standards (<u>https://www.asahq.com/</u>) are used by many rebar fabricators and is available in Bentley ProStructures.	
Two FY2025 pilot projects will deliver rebar schedules in aSa format as a non- contract document in an Excel file.	
aSa uses CRSI for minimum bar bend diameters. AASHTO references CRSI.	















B Pi	ridge Standard	s ^{>} ou	rs ir	ו IM	570) Ap	pen	dix	Ea	ffec	ts S	Stan	daro	ds	0	W	4	DO	л	
		ETC 10	ATC 14	870.40	1 11 C 41			870.00	070.00	870.70	0.00	870.80	arc ar		are or	BTC 100	1070.100	ATC 330	ANTC 117	4070.130
_	Straight Strands	010100	01007	010 40	01049	010.00	0.000	01000	01007	01010	0.019	01000	01005	01070	0.075	010100	34	38	40	44
	Deflected Strands																8	*	10	10
	Distance Defierted Strends Reised (in)																0	1	10	16
	Release Strength (osi)		-	-	-	-	-	-	-		-	-	-	-	-	-	7500	7500	7500	8000
BTC 105	18 Day Strength (rsii)																8500	\$000	9500	10000
	Design Camber (9 Pelease (Plan.in.)																2.72	2.77	2.77	2.77
	Design Camber @ Belease (Modified-in)		-	-	-	-	-				-	-	-	-	-	-	2.77	3.02	3.05	3.04
	Absolute Difference in Camber & Release (in L																0.00	0.25	0.29	0.27
	Straight Strands																	38	40	64
	Deflected Strands																	8	30	10
	Distance Deflected Strands Raised (in.)																	0	4	10
	Release Strength (osi)																	7500	7500	8000
BTC 110	28 Day Strength (psi)																	9000	9500	10000
	Design Camber @ Release (Plan-In.)																	3.24	3.24	3.24
	Design Camber @ Release (Modified-in.)																	3.24	3.52	3.48
	Absolute Difference in Camber @ Release (in.)																	0.00	0.28	0.24
	Straight Strands																		40	44
	Deflected Strands																		30	10
	Distance Deflected Strands Raised (in.)																		0	6
	Release Strength (psi)																		7500	8000
BTC 115	28 Day Strength (psi)																		9500	10000
	Design Camber @ Release (Plan-in.)																		3.60	3.60
	Design Camber @ Release (Modified-in.)																		3.60	3.82
	Absolute Difference in Camber @ Release (in.)																		0.00	0.22
	Straight Strands																			44
	Deflected Strands																			10
	Distance Deflected Strands Raised (in.)																			0
	Release Strength (psi)																			8000
BTC 120	28 Day Strength (psi)																			10000
	Design Camber @ Release (Plan-in.)																			4.01
	Design Camber @ Release (Modified-in.)																			4.01
	Absolute Difference in Camber @ Release (in.)																			0.00

Bridge Standards

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PPCB Standards have more updates coming due to Combination Pours: Anchorage zone reinforcement and strand debonding updates to address IM570 Appendix E for Combination Pours.

Combination pours allows fabricators to cast two different length beams together in the same line (e.g. BTC105 with BTC120) in order to minimize strand waste and speed production.

- Longer beam is unchanged.
- . Shorter beam is altered:
 - o Number of strands increased to match longer beam.
 - Release and final concrete strengths increased to match longer beam.
 - Draped strands are often raised to decrease camber to within 0.30° of original beam camber at release (and to lower stress).
 - o Anchorage zone reinforcement must match longer beam.
 - o Dedonding must match longer beam.

Alternate solutions - don't allow combination pours or debond full strand lengths.

















BDM Manual

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- Paddling Route Signage

 Close designated streams using signage for new bridges, bridge widenings, bridge removals, and deck replacements.
- Other types of work such as deck overlays will not require signage. Blocking the stream with temporary causeways, crossings, cofferdams or with debris are considered to be the hazards we are trying to mitigate against.
- Stream closure signage not needed for falling debris since it is a temporary condition (per DNR). [Significant debris buildup in a stream does require stream closure signage.]



BDM Manual

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Consider Foundation Interference/Influence

- A number of recent bridge replacement TSLs place new foundations too close to existing foundations.
 Interference due to existing and/or new pile batter not considered.
 Clearance needed for foundation coffer dams not considered (also seal coat when applicable).
 Assumption that new steel H-pile can be driven through existing timber pile.
 Assumption that existing piles can be extracted.
 - Vibration concerns in non-cohesive soil for staged construction or widenings.

BDM 6.1.1 addresses some of the concerns.

The most common cases involve interference between driven steel HP piles for the new bridge The most common cases involve interference between driven steel HP piles for the new bridge and timber piles from the existing bridge. In these cases, designers should not assume the timber piles will be removed nor should a note be included in the plans calling for removal. Additionally, it should not be assumed that steel piles can be driven through the timber piling. The condition of existing timber piling can vary significantly. The heads of the piles may be deteriorated enough to make it difficult to extract the timber piling and the condition of the timber piles blow the surface may be intact enough to deflect a driven steel pile causing misalignment. Also, removing a timber pile may leave a void which can reduce the lateral and axial capacity of the new steel pile.

BDM Manual

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Narrow Bridge Repairs – BDM 12.1.11 and C12.1.11

In connection with TSMO, the term "narrow bridge" was coined around 2024 to address traffic management concerns for bridge repair projects on narrow interstates and high ADT primary divided routes. Narrow bridges are somewhat loosely defined as a pair of bridges on four lane interstate highways having roadway deck widths of 39 feet or less. When bridge roadway deck widths are this narrow it is difficult to maintain two lanes of traffic in each direction during staged construction activities



BDM Manual	100 100				
Narrow Bridge Repair Example	AND DECEMPTION OF A DECEMPTION				
Bridge Repair Instead of Overlay Jasper Design No. 124/224 IMN-080-5(375)163-0E-50 180 WB/EB over Cherry Creek Maint. No. 5063.1L/R080 FHWA No. 031060/031050 Let 10-17-2023	The second secon				
District Static Lane Closure Maps https://owado.gov/korkzonentierencelibrary					
Nighttime Closures Only No ability to do deck overlays. Just do partial and full-depth Class A/B deck repairs at night. Bridge Repair Hamilton Even No. 122225 MM-305 (13) 132-36-40 MM-305 (13) 132-					





BDM Manual

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Debris Containment Systems over Railroads (and Waterways?)

DOT is discussing whether plans should require a debris containment system for concrete deck removal over railroads

Current opinion is to leave out all plan requirements for a debris containment system which is means and methods. Instead, only require submittal of a demolition plan. This leaves it to the Contractor to negotiate with railroad.

- Means and Methods Options: Suspend debris containment system from bridge to catch material. Use catch bucket for debris
- Ose catch bucket for debris. Cut deck in large pieces and use slab crab or other method to lift and remove pieces. Protect tracks, let concrete drop, do cleanup.



Bridge Rail Guide for SIIMS IOWA DOT A guide to bridge rail hardware used in Iowa by Iowa DOT and Local Systems (100 pages) https://wwadd.cov/silms/dwaf%20D0T%20Bridge%20Br Section 10 Barrier End Sections Section 11 Barrier Traffic Face Texture Guidelines

Iowa Question for NCSC in Nov 2024

IOWA DOT

Settlement and Downdrag of Existing Bridges as a Result of New Construction Settlement and Downdrag of Existing Bridges as a Kesult of New Construction This question is related to settlement and downdrag concerns for existing piles on bridge widening projects or for bridge replacement projects involving existing piles in staged construction. Invariably it seems like one of two issues arise for these types of projects. The **listif** susp. has to do with placing new embankment material on existing relatively soft cohesive material adjacent to the existing abutments such that settlement may cause downdrag on the existing piles. The second issue has to do with driving new pile or new sheet pile in relatively loose non-cohesive material such that densification may occur and cause downdrag of the existing piles. Questions are as follows: Also true for box culvert replacements placed underneath existing bridges.

a.) Have you had to deal with these issues? b.) What solutions do you employ to solve these issues?

lowa answer below. Interested in other states' answers.

a) Yes, these issues come up often for these types of projects. Iowa still follows the 0.40° rule for settlement inducing downdrag on installed piling. In the past, I wonder if the issues were pretty much ignored particularly the issue with downdrag on existing piles due to settlement caused by placement of the new embankment at the abutments. Iowa has seen issues arise due to densification of loose non-cohesive material during pile driving for some projects. b.) For the case of downdrag caused by settlement due to placement of new embankment material, we have

b) I of the case of owntang cases of y settlement due to placement of new emplantment materials, we have considered options involving core outs, store columns, geoform, and sheet pile to isolate the existing piles from the settlement. For the case involving densification of loose non-cohesive soils due to pile driving, lowa has not had a particularly good way to know when there might be an issue. In these cases we often resort to using drilled shafts if we think an issue could arise.



ABC easy as 1-2-3?	Completed ADC Lateral Olides
Three Upcoming ABC Lateral Slides Cedar Creek, 140/x40 CCS * The Control of the C	Assena, 120'x4' PPCB Cass County, FHWA 017841, Maint. No. 1563,45092 (A 92 over Small Stream BRF-092-2(36)38-15 Let 04.16,2013
Keokuk County Maint No. 5414 SS021 Maint No. 5414 S	Camp Creak, 227:44' PPCB Washington County, FHWA051661, Maint. No. 0565-15001 Jk 1 over Camp Creak BPF-001 4(30)-3842 Let 12-18-2018 Old Woman's Creak, 135:44' PPCB Johnson County, FHWA031961, Maint. No. 5278.95001 J. 1 over Old Woman's Creak
BRF-030-3(53)-38-37, Greene County, PPCB, Let 10-20-2026 BRF-037-3(10)-38-43, Harrison County, PPCB, Let 10-19-2027 New Approach to ABC? "Compressed Schedule", "Fast Traditional Construction" or (MAC) by Deproced	Brt-010100 (UP-26-22 Dirth 21-77-0010 Dirth 21-77-010 Dirth 21-77-010 Dirth 21-77-010 Dirth 21-77-010 Dirth 21-72-010 Dirth 21-72-010
Prainic Create, 100%4/ PPCB Benton County FHWA 01481 Maint. No. 0608 5S150 IA 150 over Prainic Create BRFN-150-2(24)-39-06 Let 01-17-2024 30 day detour	Maddata Coop, PHMA Deller, Marco No. 6270.00020 M 20 core Vitabulance Cred M 20 core Vitabulance Cred M 20 core Vitabulance Cred M 20 core Vitabulance Cred M 20 core Microsoft M 20 core

1.15	lei Keimorceu co	ncrete Decks for G	Fack Reduction	on
HPC Deck	Non-HPC Deck	Non-HPC Deck	HPC Deck	Non-HPC Deck
Polk Design No 120 and 419	Wayne Design No 123	Pottawattamie Design No 223	Story Design No 223	Davis Design No 123
710/x62* PPCB widened to 84/86*	194'x44' PPCB	369'x44' PPCB	282'x80' PPCB	244 x44' PPCB
Mint. No. 7733.1L&R080	Maint. No. 9307.05065	Maint. No. 7863.1S059	FHWA 049011	FHWA022521
MX-080-3(209)133-02-77	BRF-065-1(32)~38-93	BRF-059-3(44)38-78	IM-035-4(284)10313-85	BRF-083-1(91)38-26
I-80/I-35 over DSM River	US 65 over Caleb Creek	US 59 over E Br W Nishnabotna R	I A 210 over I-35	US 63 over Fox River
Let 05:21-2019	Let 02-15-2022	Let 01-18-2023	Let 02-20-2024	Let 10-15-2024
HPC Deck	Non-HPC Deck	HPC Deck	HPC Deck	Non-HPC Deck
Polk Design No 125	O'Brien Design No 120	Story Design No 123	Wapelio Design No 221/321	Allamakee Design No 125
626'x38' PPCB w/ 10' Sidewalk	120'x40' PPCB	292'x40' PPCB w/ 10' Trail	470'x30' Steel (Redeck)	229'x44' PPCB
Maint. No. 7716.1L028	Maint. No. 7143.65010	FHWA 701155	FHWA 050550/050560	FHWA 050550/050560
BRF-028-2(45)38-77	BRF-010-2(033)39-71	NHSX-030-5(277)3H-85	BRF-034-7(150)38-90	BRF-076-2(59)38-03
IA 28 over Raccoon River	IA 10 over Mud Creek	CR S-14 over US 30	US 34 EB/WB over BNSF	IA 76 over Waterloo Creek
Let 12-21-2021	Let 10-18-2022	Let 01-18-2023	Let 05-21-2024	Let 11-19-2024
HPC Deck	HPC Deck	HPC Deck	Non-HPC Deck	HPC Deck
Johnson Design No 1120	Cedar Design No 222/322	Benton Design No 224	Audubon Design No 125	Warren Design No 124
292'x30' PPCB	264'x72' PPCB	100'x44' PPCB	110'x44' CCS	239'x44' PPCB
Maint. No. 5250.60080	Maint. No. 1669.5L/R080	FHWA014481	FHWA 014091	FHWA 050881
Mr-080-7(152)251-13-52	IM-NHS-080-7(164/108)27003-16	BRFN-150-2(24)39-06	BRFN-071-4(55)-39-05	BRF-065-3(83)38-91
Wapsi Ave over I-80	I+80 WB/EB over Sugar Creek	IA 150 over Prarie Creek	US 71 over Sifford Creek	US 65 over Otter Creek
Let 02-15-2022	Let 10-18-2022	Let 01-17-2024	Let 10-15-2024	Let 01-22-2025
Non-HPC Deck	HPC Deck	HPC Deck	Non-HPC Deck	HPC Deck
Franklin Design No 122	Polk Design No 323	Polk Design No 724	Carroll Design No 125	Jones Design No 124
204'x44' PPCB	297'x34' PPCB	287/30/ PPCB	150'x44' CCS	120'x40' PPCB
Maint. No. 3577.75085	Maint. No. 7798.70035	FHWA 041891	FHWA 017111	FHWA 032251
BRF-065-7(42)38-35	IM-035-4(246)99–13-77	IM-035-4(305)10113-77	BRF-030-2(172)38-14	BRFN-151-4(126)39-53
US 65 over Bailey Creek	NE 142nd Ave over I-35	NE 158 th Ave over I-35	US 30 over Storm Creek	US 151 over Kitty Creek
Let 02-15-2022	Let 12:20-2022	Let 02-20-2024	Let 10-15-2024	Let 02-18-2025







UHPC Overlays	Completed Proprietary UHPC Overlay Projects Mud Creek Bridge Buchanan County, Brian Keiefleber Constructed in 2016
Future UHPC Overlay Project	205.5"x44' PPCB (Bridge built in 1992, 1 st overlay) Sioux County, FHWA048351, Maint. No. 8441.35018 US 18 over Floyd River BRRN-018-1(94)-93-84 Let 07-18-2018
296'x40' PPCB (New Replacement Bridge) Grundy County, FHWA 025842, Maint. No. 3831.3S014	98'x44' PPCB (Bridge built in 1974, 1 st overlay) Jasper County, FHWA030811, Maint. No. 5015.8R163 IA 165 EB over WahnL Creek BRFN-163-2(56)-39-50 Let 11-19-2019
IA 14 over Black Hawk Creek BRF-014-6(42)38-38 Let 02-18-2025	151.33'X44' PPCB (1974 bridge, 1" overlay) Humboldt County, FHWA028941, Maint. No. 4683.15169 US 169 over Trufner Creek BRF-169-7(047)-38-46 Let (02-72023
8.5-inch thick concrete deck 1.25" thick UHPC overlay (2 nd course)	220.33 'x40' PPCB (1974 bridge, 1" overlay) Poik County, FHWA 602320, Maint. No. 7752.5R141 IA 141 EBS5 lover IA.44 BRTN-141-7(57)-35-77 Let 02:20:2024
Top of Special Rock By → Symmetrical About 2 (Readway gr → Sym	151.33"x44' PPCB (New Replacement Bridge) Cass County, FHWA 017821, Maint. No. 1548.65092 IA 92 over Sevenmile Creek BRF-092-2(44)38-15 Let 09-20-2022 - 8-inch thick IBPC-nominatery overfav (2 ^{er} cruste)



	Second Course PPC for New Deck							
	Warren Design No 124 239'x44' PPCB Maint. No. 9148.85065, FHWA 050881 BRF-065-3(83)38-91 US 65 over Otter Creek Let 01-22-2025			1881	Symmetrical About + Readway	Surface of Deck Surface of Dec Overlay Surface of PCC Overlay Surface of PCC Overlay Surface of PCC Overlay Surface of Deck		
SPECIAL PROVISIONS FOR POLYESTER POLYMER CONCRETE OVERLAY WITH HIGH MOLECULAR WEIGHT METHACRYLATE RESIN PRIMER ON NEW BRIDGE DECK					R WEIGHT			
26	2599-9999018	DECK OVERLAY POLYESTER POLYMER CONCRETE	SY	1,183.1	Includes surface preparation and Overlay in accordance with Speci with High Molecular Weight Metha and placing concrete sealer.	application of Polyester Polymer Concrete (PPC) al Provisions for Polyester Polymer Concrete Overlay acrylate Resin Primer. Includes cost of furnishing		

More Restrictions on Concrete Removal?















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The End	