Summary of Deck Placement Issues

	Issue	**Policy Change**
CONSTRUCTION	Place concrete in a manner that minimizes differential deflections across the transverse section.	*CMS 511.10 & 511.19* For structures with a skew angle greater than fifteen (15) degrees and up to fifty (50) degrees, load and finish the concrete at the skew angle.
		CMS 511.10 & 511.19 For structures with a skew angle greater than fifty (50) degrees, load the concrete at the skew angle and finish the concrete at fifty (50) degrees. The furthest the concrete shall precede the finishing machine is 20 ft.
	Reduce the potential for web distortion ("oil-canning") under overhang bracket loading.	*CMS 508.02* Locate the lower contact point of overhang falsework within 8 inches (200 mm) of the top of the rolled beam or steel girder's bottom flange.
	Reduce potential for unanticipated girder deflection during deck placement.	*CMS 513.26* Permanently fasten all cross frames and lateral bracing before deck placement begins.
DESIGN	Reduce potential for deck thickness loss due to web distortion ("oil-canning") under overhang bracket loading.	*BDM 302.4.1.7* For steel girder web depths > 78", specify Item 508.02 "as per plan" and specify the lower contact point of overhang falsework in the plans.
		BDM 302.2 For steel girder web depths > 78", determine amount of girder twist from "oil-canning" ($\mathbf{N}_o$) and associated screed rail deflection (δ_{left} & δ_{right}) and deck thickness loss. Stiffen web as necessary by reducing transverse stiffener spacing, thickening web or providing design for temporary web bracing in the plans.
	Reduce potential for deck thickness loss due to girder warping between crossframes under the overhang load.	*BDM 302.2* Designers shall determine amount of girder twist from girder warping between crossframes ($\mathbf{N}_w$) and associated screed rail deflection (δ_{left} & δ_{right}) and deck thickness loss. Reducing crossframe spacing and stiffening flanges of main members can reduce the effect of girder warping.

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DESIGN	Minimize global deformation (i.e. "frownie face" ☹) across the transverse section of NEW steel or prestressed superstructures.	*BDM 302.2* Layout the transverse section such that the tributary deck load carried by the fascia member does not exceed 110% of the average tributary deck load carried by interior members. A Line Girder Analysis of the superstructure is acceptable and twist ($\mathbf{N}_g$) due to global deformation may be neglected.
	Minimize global deformation (i.e. "frownie face" ☹) across the transverse section of EXISTING steel or prestressed superstructures.	*BDM 302.2* Layout the transverse section such that the tributary deck load carried by the fascia member does not exceed 115% of the average tributary deck load carried by interior members. A Line Girder Analysis of the superstructure is acceptable and twist ($\mathbf{N}_g$) due to global deformation may be neglected.
	If the 110% or 115% rules for new or existing bridges respectively cannot be met, reduce the potential for deck thickness loss due to global deformation across transverse section.	*BDM 302.2* When the tributary deck load carried by the fascia member does not meet the previous requirements, perform a Refined Analysis of the superstructure to determine twist due to global deformation ($\mathbf{N}_g$) and associated screed rail deflection (δ_{left} & δ_{right}) and deck thickness loss.
	Reduce potential for deck thickness loss on prestressed I-Beam superstructures due to insufficient lateral bracing during deck placement.	*BDM 302.5.2.6* Designers shall analyze the diaphragms for the overturning loads applied by the overhang brackets during deck placement. Additional diaphragms or temporary bracing details may be required. "Oil-canning" and warping effects associated with steel superstructures may be neglected.
	Design a superstructure that maintains minimum cover & deck thickness throughout placement.	*BDM 302.2* The total loss of deck thickness from the three sources of girder twist ($\mathbf{N}_o$ $\mathbf{N}_w$ and $\mathbf{N}_g$) shall not exceed ½ in.
	How should global deformation ($\mathbf{N}_g$) for a structure with complex geometry (e.g. curvature, skews > 50°, multiple skews, etc.) be determined?	*BDM 302.2* For structures with complex geometry, the designer should consider a more detailed analysis of the pour sequence to determine if the sequence itself leads to potential cover loss in excess of ½" at specific locations throughout the deck.

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DESIGN	Reduce potential for unanticipated girder deflection during deck placement.	*BDM 302.4.2.3* Slotted holes shall not be used in crossframe connections. Crossframe connections shall be fully welded or designed to prevent slip during the deck placement operations.
	What is the maximum pouring width for a wide skewed bridge?	*BDM 302.2* The paving width as measured along the skew should be kept less than 120'. Introducing longitudinal construction joints may be required. Contact the ODOT Office of Construction Administration if a paving width > 120' can not be avoided.