

## Every Day Counts

### Case Study Number and Description: CS #5 – Widening of Long Low-Level Bridge Located Over a Floodplain and a Navigable River

	In this section, indicate whether prefabricated bridge components should be considered during the BDR evaluation	<b>Conventional Alternate</b> (yes/no/na)	<b>Prefab. Alternate</b> (yes/no/na)	<b>Comments</b>
1.	Prefabricated Beam	Yes	Yes	Given the span lengths, the BDR should consider FIB's for all approach spans for both the conventional and prefabricated alternates. Spans lengths should be made to match existing. The BDR should match the continuous steel spans for the channel span over the river for both the conventional and prefabricated alternates.
2.	Prefabricated Piles	Yes	Yes	The BDR should consider both drilled shafts and prestressed piling for both the conventional and prefabricated alternates.
3.	Precast Footing	No	Yes	Precast Footings could be considered for the prefabricated alternate in conjunction with a top-down construction approach. See discussion below outlining a rubber tired straddle crane option. Limitations of straddle crane lifting capacities and loads on existing deck should be investigated in BDR.
4.	Prefabricated Bent Cap	No	Yes	Precast bent caps could be used for both intermediate and end bents utilizing the same pile configuration.
5.	Prefabricated Pier Column	No	Yes	For the prefabricated alternate, the BDR should consider a precast pier column that utilizes flowable concrete mixes with embedded polystyrene blocks designed to be connected to precast cap and footing components using grouted rebar couplers. Used in conjunction with rubber tire type straddle cranes and top-down construction approach defined below.
6.	Prefabricated Pier Cap	No	Yes	For the prefabricated alternate, the BDR should consider a precast pier cap that utilizes flowable concrete mixes with embedded polystyrene blocks designed to be connected to precast column components using grouted rebar couplers. Used in conjunction with rubber tire type straddle cranes and top-down construction approach defined below.
7.	Prefabricated Prestressed Deck Units (w/o beams)	NA	NA	Does not apply.

8.	Prefabricated Full-Depth Deck Panels (w/ beams)	No	No	Due to differential camber concerns of long prestressed FIB's, both the conventional and prefabricated alternates should consider only C.I.P. decks with coated S.I.P. forms. Also uncertainty of details given size of project also a factor in decision.
9.	Prefabricated Complete Superstructure	No	No	May be a possible option if used with SPMT's for span delivery with an overhead gantry/beam launcher. Not deemed as beneficial, however as the top-down gantry crane option described below due to limitations of the overhead gantry/beam launcher system during substructure construction where drilling/driving rigs located in the median require material delivery.

In this section, include project constraints and user impact considerations:

Bridge Widening: For the purpose of this case study, it is assumed that the bridge widening would be limited to the median.

Water Access: For the portion of the interstate bridge over the river, it is assumed that the water depths at the site would allow full barge access from shoreline to shoreline.

Wetland Impacts: For the purpose of this case study, it is assumed that any impacts outside the outer copings of the existing parallel structures should be limited due to environmental concerns however, either permanent or temporary structures could be placed within the median.

Flood Plain: It is assumed that haul roads would not facilitate construction access through certain parts of the year due to flooding and that temporary work bridges or top-down construction may be necessary.

Top Down Straddle Crane Construction Concept for Prefabricated Option: Approach span foundations would be installed from cranes founded on mats or temporary trestles that would be leap-frogged across the site. See project photos. Foundations located in the river would be installed from barge mounted cranes. Beams, precast footings, pier columns, and pier caps, beams and superstructure materials would be delivered via rubber tire straddle cranes resting on the existing bridge decks.