

Every Day Counts

Case Study Number and Description: CS #4 - Braided Ramp Over Ingress Into International Airport

	In this section, indicate whether prefabricated bridge components should be considered during the BDR evaluation	Conventional Alternate (yes/no/na)	Prefab. Alternate (yes/no/na)	Comments
1.	Prefabricated Beam	Yes	NA	The BDR should consider a steel box prefabricated superstructure for the conventional alternate in order to match the existing box shape of the nearby interchange. The BDR should include a superstructure move option using Self-Propelled-Modular-Transporter (SPMT) whereby the existing three span segmental braided ramp superstructure would be moved onto new foundations located at the new ramp alignment.
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	No	Not deemed to be beneficial because precast footings would be constructed outside of the existing roadway footprint. Not deemed to be beneficial because the number of components is small (two footings total) to justify precast set-up and construction learning curve.
4.	Prefabricated Bent Cap	No	No	Not deemed to be beneficial because end bent construction is typically easy to construct in-situ and the number of components is small to justify precast set-up and construction learning curve.
5.	Prefabricated Pier Column	No	No	Not necessary because segmental bridges do not require a pier cap.
6.	Prefabricated Pier Cap	No	No	Not deemed to be beneficial because pier caps would be constructed outside of the existing roadway footprint. Not deemed to be beneficial because the number of components is small (two caps total) to justify precast set-up and construction learning curve.
7.	Prefabricated Prestressed Deck Units (w/o beams)	NA	NA	Does not apply.
8.	Prefabricated Full-Depth Deck Panels (w/ beams)	No	NA	Does not apply for prefabricated alternate if superstructure reuse option with SPMT's is utilized.

9.	Prefabricated Complete Superstructure	No	Yes	See superstructure reuse option using SPMT's described above.
In this section, include project constraints and user impact considerations:				
<p data-bbox="261 296 719 327"><u>Conventional Construction Approach</u></p> <p data-bbox="261 363 1406 527"><u>Braided Ramp Relocation.</u> The traditional design approach for a relocated bridge on a land project would be to construct a bridge at the new alignment (affecting the ramp underneath, interstate NB exit to international airport), then shift traffic to the new ramp and demolish the old ramp (again affecting interstate NB exit to international airport). Traffic on the interstate NB on-ramp from the local road should be relatively unaffected, except for the alignment shift.</p> <p data-bbox="261 562 1401 863"><u>Bridge Demolition.</u> Generally demolishing an existing beam type bridge would require a minimum of 2-3 day duration per span or slightly longer for continuous spans. The duration for demolishing a segmental bridge constructed in balanced cantilever however may take as long as 8 to 10 days per span. A bridge of this type is typically demolished in reverse order than it was constructed utilizing temporary stability towers. During bridge demolition, ramp closures would be required to move traffic from under these work operations. Since the interstate NB Off-ramp is a major ingress into the international airport, any disruption to traffic or back-ups, especially those that affect flight departure traffic into the airport, would be problematic. Moving traffic under adjacent spans of the braided ramp is not an option due the roadway geometry.</p> <p data-bbox="261 898 1360 961"><u>Beam Placement.</u> Beams may be placed at night using ramp closures in order to move traffic from under beam placement work operations.</p> <p data-bbox="261 997 719 1029"><u>Prefabricated Construction Approach</u></p> <p data-bbox="261 1064 1390 1192"><u>Braided Ramp Relocation.</u> The use of SPMTs allows for the entire bridge ramp to be translated from its existing location to the relocated alignment. New foundations can be constructed “off-line” from major traffic conflicts at the new location and made ready to receive the relocated bridge structure.</p>				