

Indiana

State DOT Representative Report Questions

National Concrete Consortium

San Antonio, Texas

April 2, 2009

Theme: Ride Quality for Bridges

Please provide your state DOT's perspective regarding the following theme questions. Each NCC state DOT representative will be asked to present their responses to the group during the State Report forum on Thursday morning, April 2, 2009.

1. What features of a bridge deck and approach do you consider to have the most impact on ride quality?

The Terminal Joint located between PCCP and the oncoming reinforce concrete bridge approach (RCBA) has the greatest effect on ride quality. It is typically worse when the structure has an integral or semi-integral end bent. Settlement of the leading edge of the RCBA or heaving of the HMA contained within the 2 foot wide Terminal Joint are the most common problems affecting ride quality.

On bridges with skew, where the finishing machine is set up perpendicular to the centerline, the deck surface near the construction joint or an expansion joint is problematic to achieve smoothness and ride quality.

2. How does your state measure ride quality for bridge decks?
 - a. IRI? No, but see the answer to question 12.
 - b. Straight edge? A 10 ft rolling straightedge is used for checking the RCBA. Bridge decks are checked with a 16 foot long rolling straightedge.
 - c. Other? During construction of the bridge deck, a long handled 10 ft straightedge is used periodically to check the plastic concrete surface prior to texturing. High areas are removed and depressions filled and finished with a five foot long float.
 - d. Specifications? Yes, 704.05 and 502.20 for bridge decks. RCBA are covered under 609.11.

3. What smoothness thresholds does your DOT require for bridge decks?

A 10 ft rolling straightedge allows for a 1/8" maximum variation. A 16 ft rolling straightedge allows for a maximum variation of 1/4".

4. How are transitions near localized features (drainage basins, joints) treated in efforts to ensure acceptable ride quality?

The tops of floor drains are to be set no more than 1/2" below the adjacent gutter grade. The transition is finished by hand. The transition from the cross slope to the edge of the drainage inlet is about 1/2 foot.

The mechanical finishing machine is set up on rails for grade control and checked for proper clearance of the transverse joints prior to the deck pour.

5. What corrective actions are required for substandard bridge deck/approach ride quality?
High spots are ground down to within the allowable variation.
6. Does your state initiate a penalty/incentive structure for bridge ride quality? No.
7. Does your state consider ride quality as a scoping item for bridge rehabilitation?
No, but there have been occurrences where the leading edge of the approach slab has settled significantly and required repair by jacking of the RCBA and/or wedge and level with HMA.
8. Does your state require sequencing (casting positive moment regions prior to negative moment regions) of deck pours during placement of bridge deck concrete for continuously designed decks?
Such joints are typically shown on the plans for the floor slab of prestressed concrete beam structures; however, the transverse construction joints may be eliminated by written approval under the following conditions:
 - (a) A retarding or water-reducing retarding admixture shall be used in the concrete to delay set as required and approved.
 - (b) Concrete shall be placed the full width of the structure, unless otherwise approved.
 - (c) It is determined that the concrete on two adjacent spans can be placed within a period of time which is less than the time for the initial set of the concrete section over the pier common to the two spans.
9. What method and type of texture does your state apply to your bridge deck surface?
The surface must be tined in accordance with 504.03 and is typically applied by hand from a work bridge using a tining rake.
10. How does your state handle transitions/approaches from pavement on to the bridge deck (approach length, profile, joints)?
The RCBA must be a minimum length of 20 feet as measured from the obtuse angle of the approach slab's intersection with the bridge deck (i.e. Type IA or expansion joint). A Terminal Joint and support ("sleeper") slab is required between PCCP and the RCBA.
11. Does your state maintain a database for bridge ride quality? No.
12. How does your state report its network ride quality for pavements and bridges to the Highway Performance Monitoring System (HPMS) database (network report excludes or includes bridges with pavements)?
Yes, INDOT measures IRI on its roads and reports results to the FHWA. The IRI results are used as part of the condition assessment of the roads in Indiana so planning and preliminary engineering can prepare and schedule future road contracts. The IRI values for a section of road initially include pavement miles and bridges as part of the assessment. The results from the bridges are filtered out to leave only the IRI for the miles of pavement. Although the IRI results for the bridges are technically collected, or known, the data is not used to evaluate the condition rating for the structure.