

# Pennsylvania

## 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?  
Settlement in the approaches is probably the number one issue. Secondly are the joints at the abutments and within the deck itself. Lastly, and probably the least impactful is the final finish and texture of the deck slabs themselves. Obviously if the final deck finish is very poor, then this would be a greater issue, but in general this does not seem to be the source of poor ride quality in PA on our new bridge projects. Mostly settlement and joints cause us the most problems.
2. How does your state measure ride quality for bridge decks?
  - a. IRI?
  - b. Straight edge? We use straight edge.  
Following are excerpts from our specification:  
"Conduct final finishing operations immediately behind the finishing machines or screeds from work bridges of rigid construction, not in contact with the surface of the concrete, set on rails, and easily moved. Finish with a 3m (10-foot), long-handled straightedge to achieve a smooth finish."  
"While concrete is still plastic, test the surface using a 3 m (10-foot) straightedge"... "as required. Hold the straightedge in contact with the surface in successive positions. Advance in successive stages of not more than 1.5 m (5 feet) a stage. Immediately correct low areas, then strike off, consolidate, and refinish. Cut down high areas and refinish. Make sure the surface across joints meets requirements for smoothness" as follows "Remove high points in excess of 6.5 mm (1/4 inch) by means of grinding or cutting tools, as directed. The Representative will consider pavement containing depressions of more than 6.5 mm (1/4 inch) to be defective." "Continue straightedge testing and surface corrections until the entire surface is free from observable departures from the straightedge and until the slab conforms to the required grade and cross-section."  
After concrete has hardened, the same tolerances are applicable and the same straight edge procedure applies.
  - c. Other?
  - d. Specifications?
3. What smoothness thresholds does your DOT require for bridge decks?  
See answer to question #2
4. How are transitions near localized features (drainage basins, joints) treated in efforts to ensure acceptable ride quality?  
Transitions are shown level smooth in the construction standards and no tolerances are specified for smoothness.

5. What corrective actions are required for substandard bridge deck/approach ride quality?  
This is handled on a case by case basis depending on the severity of the issue. See answer to question #2 for defects more than 1/4" using a 10' straight edge. If high spots need to be corrected, grinding is utilized to improve profile. For bridge approach settlements slab jacking has been utilized at times. In a very severe case, complete removal and replacement may be required.
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, at least not in any formalized process. Obviously bridges most in need of deck repairs probably have poor ride quality.
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? Yes. Placement sequences are indicated by the Department for the contractor to utilize.
9. What method and type of texture does your state apply to your bridge deck surface?  
Spec excerpt: "texture the surface transversely for the full pavement width. Produce a textured finish with grooves that have the following characteristics: rectangular in shape; from 2.5 mm to 5 mm (3/32 inch to 3/16 inch) in width; and from 3 mm to 5 mm (1/8 inch to 3/16 inch) in depth. For a 3 m (10-foot) rake use center-to-center tine spacing as follows:

**TABLE C (English)  
Center-to-Center Tine Spacing**

1 3/8	1 3/8	1 7/8	2 1/8	1 7/8	1 3/4	1 1/4	1 1/4	1 1/8	1 3/8	1 1/8	1 3/4	7/8	1 3/4	7/8
1 5/8	2	1	3/4	1 1/8	1 5/8	1 3/8	1 1/8	1	1	1 1/8	3/4	1 1/2	1 1/2	2
2	1 3/4	1 1/2	1 3/4	2 1/8	1/2	1 1/8	1 1/2	1 5/8	1 5/8	1 1/8	1 3/4	1/2	1 3/4	1 3/4
1 1/8	1 1/2	1 1/4	1 5/8	1 1/8	1 1/4	2	1 3/8	1 3/4	5/8	3/4	1 3/4	2	5/8	2 1/8
2	1 1/8	1	3/4	5/8	2 1/8	3/4	1 1/2	2	1 5/8	5/8	5/8	1 7/8	2	1 1/2
2	1 3/8	1 3/8	1 1/2	1 3/4	1 1/8	1 1/2	2	1	1 1/4	(in)				

When using this chart begin in the upper left corner and read across the entire row then start again on the left side in the next row.

10. How does your state handle transitions/approaches from pavement on to the bridge deck (approach length, profile, joints)? A 25' long 16" depth approach slab is the standard. At the interface of the pavement section and approach slab a 5' long, 12" depth sleeper slab is placed underneath to support the transition from pavement to approach slab. This results in two joints, the first centered on top of the sleeper slab and the second at the bridge itself. The profile at the joints is shown level smooth in the construction standards and no tolerances are specified for smoothness.
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)? Includes Bridges (with one exception, open grate bridge decks are excluded which make up a minute portion of the Commonwealth's bridge decks)