

Michigan

State DOT Representative Report Questions
National Concrete Consortium
San Antonio, Texas
April 2, 2009

Theme: Ride Quality for Bridges

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

In order of decreasing impact. a) approaches b) modular joints on long span bridges, c) construction joints between pours, d) bridge geometrics e) regular expansion joints.

2. How does your state measure ride quality for bridge decks?
 - a. IRI?
 - b. Straight edge?
 - c. Other?
 - d. Specifications?

Currently, we enforce a straight edge specification (1/8-inch in 10 feet). A pilot project was initiated several years ago using the Michigan-specific Ride Quality Index (RQI) specification. From this, it was concluded that the smoothness thresholds for pavements were not realistic for bridge deck applications.

An upcoming pilot project will be let in April 2009 requiring bridge deck IRI to be measured. These efforts are further intended to gauge contractor response and also provide guidance for further development of bridge deck smoothness specifications.

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

Plus or minus 1/8 inch in 10 feet (straight edge) is currently the standard specification for bridge decks. The upcoming pilot specification requires measurement using an inertial profiler with corrective action for surface irregularities exceeding 0.3 inches in a 25 foot, per California Profilograph mathematical representation. The objective of the pilot specification is to report IRI and to perform the profile simulation using ProVAL. A long term objective would be to explore the ProVAL smoothness assurance modules as a replacement for the California Profilograph mathematical representation.

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

If possible, the localized features should be placed outside the wheel paths during installation. If not possible, these localized features may be eliminated by recognizing their exclusion during profile analysis. Check for proper placement of joints or castings during the dry run of the screed. Also, specific cases may require deck joints to be installed slightly low to allow for profile grinding very close to the joint, if needed.

5. What corrective actions are required for substandard bridge deck/approach ride quality?

The current straight edge specification requirements apply for bridge deck surfaces. The pavement ride quality specification (IRI threshold of 75 inches per mile) applies for the approach pavement.

6. Does your state initiate a penalty/incentive structure for bridge ride quality?

Currently, we do not have a penalty/incentive structure in place. Deficiencies must be corrected prior to acceptance.

7. Does your state consider ride quality as a scoping item for bridge rehabilitation?

No. However, we are currently engaged in discussions with our project development staff to encourage them to include provisions for ride quality as part of their project scoping activities, especially when transitions and bridge approaches are involved.

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. When applicable, positive moment regions of continuous decks are placed first to minimize excessive tensile stresses in the hardened concrete throughout the negative moment deck regions. The bridge design and analysis program adjusts the slab and screed deck grades accordingly.

9. What method and type of texture does your state apply to your bridge deck surface?

Transverse texturing.

10. How does your state handle transitions/approaches from pavement on to the bridge deck (approach length, profile, joints)?

For new construction, issues relative to a smooth transition are most often contingent on the level of quality workmanship during grading. If the bridge and road projects are being constructed concurrently, it is crucial that the transition profiles be coordinated between contractors. If the project is stand alone, we currently do not program adequate approach length to accommodate unforeseen grade discrepancies during the scoping phase of the project. Hence, we often incur an as-constructed rough transition to and from our bridges.

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)?

For the past three years, bridges profile data were included in the network IRI numbers reported to the HPMS database.