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January 23, 2012

Ms. Anne Rearick
Director of Bridges
Indiana Dept. of Transportation

Dear Ms. Rearick:

We were forwarded a copy of review comments about our Stage 1 plans for the Ford Road Bridge project (Des. 9506590), sent by e-mail to Mike Wink. We had not expected additional review comments 13 months after our submission and a year after your consultants Janssen and Spaans sent the formal review comments, but we appreciate your interest.

We have reviewed the concerns expressed in that email, and offer the following response:

Regarding your first 'bullet point':

We found barrier crash test requirements for 30 mph and 40 mph design speeds in the INDOT Design Manual (TL-2 and TL-4 railing ratings, respectively), but none for 35 mph so we consulted the AASHTO Guide Specifications for direction as to which should be used. Those specifications (Note 1 on last page here) indicate to us that a TL-2 railing would be appropriate for our project. Could you clarify why you think a TL-4 railing is required and the quoted AASHTO guidance is not applicable to our project?

CF-1 rail was downgraded to TL-2 rating this month after at least 7 years in the design manual as TL-4. Your e-mail says it had been "misidentified as a TL-4." Randy Strain of your office told us TL-2 is the correct rating because that is how the Oregon 2-Tube Rail (which the CF-1 resembles) is listed in appendices to FHWA's memo of May 30, 1997.

Mr. Strain was unaware that the 'Alaska Multi-State Bridge Rail', basically the Oregon 2-Tube design with a greater wall thickness, passed TL-4 crash tests in 1998 (details in Note 2 on last page). The 'CF-1' bridge rail is essentially identical to the Multi-State Rail (*not* the pre-1998 Oregon 2-Tube), so downgrading the CF-1 rating based on the 1997 memo is inappropriate. Minor differences between 'Multi-State Rail' drawings and INDOT's CF-1 could easily be corrected (they may be transcription errors made while copying Oregon's drawings).

If after further consideration you still feel a TL-4 rail is required and the CF-1 does not qualify as such, we will be happy to substitute the Alaska Multi-State Bridge Rail in our design and provide necessary documentation in accordance with new Chapter 404, Subsection 4.02 of the Manual.

Regarding your second 'bullet point':

We had hoped that by extending our project limits we could make minor improvements to the sharp curve south of the bridge without exceeding our project scope. In deference to your concerns, however, and considering INDOT's long-standing direction that the project length of bridge replacement projects should be kept to the minimum needed to meet geometric standards, we are redesigning the project to reduce the project length and ensure the curve is beyond the project limits.

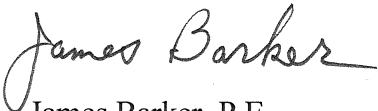
Regarding your comments on curb design:

In deference to your concerns about the off-structure guardrail, we will make sure that it conforms with Design Manual Figure 59-1G (new in year 2011) as you verbally requested (phone conversation, Dec. 29, 2011).

Your email expressed concern that curbs and gutters are inconsistent with the project's rural character. The project area is rapidly urbanizing, and INDOT recently reclassified Ford Road from Rural Collector to Urban Arterial. Furthermore, Boone County is planning to add curbs and gutters to 96th Street to meet the end of our project, with construction starting later this year. AASHTO policy holds that "curbs are used extensively on all types of low-speed urban highways."¹ Our preliminary design did not use curbs, but because of these considerations and a view to the future we feel that curbs and gutters are appropriate.

We hope that the explanations above (and attached notes 1 and 2) address your concerns. If not please contact us. Again, we appreciate your interest in the project and the effort you made to review our Stage 1 submissions. With the slight changes noted in previous paragraphs, the project design will meet all level one design criteria, making design exceptions unnecessary. It would help us in our work, reduce costs, and reduce project delays if future design review comments are communicated to us as promptly as possible. Thank you for your time and attention.

Sincerely,


James Barker, P.E.


Matt Reckard, P.E.

cc. Mike Wink, INDOT Crawfordsville Dist.; Rick Carney, Boone Co. Road Supervisor

¹ From *A Policy on Geometric Design of Highways and Streets* (the 'Green Book'), Chapter 4 discussion of General Considerations for Curbs.

Attachment – Notes

1. Section 13.7.2 of the *AASHTO Bridge Design Specifications* say TL-2 criteria are “generally acceptable...where a small number of heavy vehicles is expected and posted speeds are reduced”, and that TL-4 is appropriate “for high speed highways, freeways, expressways, and Interstate highways with a mixture of trucks and heavy vehicles.” The former much better describes Ford Road, with its 35 mph design speed, modest traffic count, and small percentage of heavy vehicles, than the latter.
2. The crash tests were performed by Texas Transportation Institute under contract to four state highway departments (Alaska, Washington, Oregon, and North Dakota). Links to the test reports (and those for tests of associated transition guardrail) can be found at the Alaska DOT&PF Bridge Design Section’s web page. Oregon’s standard drawings of the rail (BR206 and BR207), which both the Oregon and Washington Bridge Design Manuals list as TL-4 rated, is available at Oregon DOT’s web site. Alaska’s bridge rail drawings are not, so we attach drawings Elmer Marx (Alaska DOT&PF Senior Bridge Design Engineer) sent us. FHWA’s letter approving the design as TL-4 is on-line at http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/barriers/pdf/b-55.pdf.

