KYTC Divisions of Construction/Structural Design/Quality Assurance and ACEC Bridges, Inspection & Design Sub-Committee Partnering Meeting

Monday, December 7, 2015, 10:00 AM – 12:00 PM

Minutes

These minutes provide an outline of discussions at the Division of Construction, Structural Design, Quality Assurance Branch, and ACEC Bridge Sub-Committee partnering meeting held at the Transportation Cabinet Office Building. Those in attendance were:

- Mark Walls Division of Construction (DoC)
- Vibert Forsythe Division of Construction
- Austin Shields Division of Construction
- Ryan Gossom Division of Construction
- Brent Sweger Quality Assurance Branch (QAB)
- Shawn Russell Quality Assurance Branch
- Mark Hite Division of Structural Design (DoSD)
- Joseph Van Zee Division of Structural Design
- John Broadus HDR
- Steve Goodpaster American Engineers, Inc.
- Wendy Harper Parsons Brinckerhoff
- Scott Ribble Burgess & Niple

Discussion topics included:

1. **Purpose** – This meeting was requested by the Sub-Committee to continue the dialog with the Division of Construction, the Quality Assurance Branch, and the Division of Structural Design. The goal is to exchange feedback on design and construction issues that could be addressed or avoided in future projects, resulting in more economical, easier to construct, and longer lasting bridges.

2. **Division of Construction Discussion Topics**

   a. Mark Walls stressed the importance of providing sufficient clearance between centerline of rail and edges of footings on railroad overpass structures to ensure there is adequate room for temporary shoring, clearance for existing wings, etc.
b. Mark Walls indicated that some Districts would like to increase the use of architectural treatments in urban settings. District 11 has made use of concrete stains in concert with form liners in lieu of masonry coating; the District has prepared notes that could potentially be used on other projects. On recent projects where aesthetic features were requested by the District, HDR has used a sealant in the locations where a formliner is used instead of the masonry coating.

c. The group discussed whether there could be cost savings by using single-slope barrier walls. The general consensus was the cost savings would not be significant if the barriers are slip-formed.

d. After a recent incident, concern was expressed for construction and maintenance work done on bridge decks with standard 34” tall barrier walls. OSHA requirements for fall hazards require railings to be 42” +/- 3” tall. As such, workers should rely on another form of fall protection when working near bridge railings to comply with OSHA regulations.

3. **Follow-up topics from the previous meeting**

a) As-built plans – The group revisited the discussion of the process by which as-built plans are prepared, delivered, and stored. KYTC Resident Engineers currently are responsible for preparing as-built plans and delivering them to Central Office. Mark Hite indicated that as-builds rarely make their way to his office. It was noted that while it is not particularly necessary to document every time a piece of reinforcing steel is moved during construction, critical information such as changes to footing sizes and elevations can have a significant impact on future widenings or adjacent construction. Accurate as-built plans are also necessary to prepare load ratings. The group discussed requiring contractors to prepare as-built plans on a few trial projects. The Sub-Committee will provide a draft Special Note to this effect along with these minutes to the meeting attendees.

   Additionally, the group discussed storage of as-built plans. It was suggested that storage on the same server as the design drawings would provide access by drawing number to those who needed them. The Division of Maintenance could also add the plans to the BrM server if they desired.

b) Masonry coating study – Mark Walls will contact KTC to check the status of the proposed study of various masonry coatings, sealants, etc.

c) Post-construction services by the design consultant – Currently there is no procedure for consultants to get paid for post-design services after a bridge design contract has been closed, and it is generally not desirable to leave a contract open potentially for several years between completion of design and construction. Mark Hite commented that it is ideal for the original consultant to make revisions that are required based on unforeseen field conditions (e.g. changing the elevation of a footing due to subsurface
conditions; consultants are not requesting a mechanism to get compensated for addressing errors and omissions). Since most of the times this occurs the schedule is tight, the original consultant will be able to make the changes in the least amount of time. Utilizing a different consultant to make changes during constructions also raises various liability issues. The group discussed possibly requiring contractors to utilize the original consultant when changes are necessary during construction, though there was concern about having prepare subcontracts between contractors and consultants. Mark Hite indicated that although there are a large number of prequalified consultants, approximately ten to fifteen firms have frequent design projects. Mark Walls stated that he would explore potential solutions with Eric Pelfrey.

4. **X dimensions for hybrid beams**

   a. KYTC does not have a desired tolerance for X dimensions. Joe Van Zee noted that in-house designs typically use $\frac{3}{8}''$ to 1" at the edge of the flange. He also stated that they are using camber values at erection without additional multipliers. The Division of Construction has not been made aware of any issues with camber on hybrid beams.

   b. With the particularly wide top flanges on hybrid beams, contractors need to be aware that there could be a significant difference in X dimensions measured at centerline versus edge of beams, particularly on structures with large cross slopes. Some contractors have complained about the additional concrete required in haunches. Mark Hite noted that concrete quantities should include the volume of the haunches and that the quantities are typically conservative as no deductions are taken for the volume of reinforcing steel. Brent Sweger suggested that some projects with hybrid beam structures would be good candidates for post-construction reviews.

5. **Constructability of Excavations** – Consultant have been designing retaining walls in accordance with KYTC specifications for required cut slopes. During construction, these walls have been often value engineered by contractors who are taking greater risks regarding cut slopes. The sub-committee questioned if it would be a better value to KYTC to have retaining walls be design-build components of a project. KYTC has concerns that the wall designs performed by the contactor would not be as well thought out as those designed by consultant. After some issues with contractor designed walls, some districts require that all walls, including sound walls, be designed by consultants. Mark Walls stated that he doesn’t recall any contractors claiming that consultant designed walls were not constructible. However, he reiterated the importance of providing sufficient horizontal clearance to railroad tracks. It was also noted that modifications to standard gravity walls may be necessary when the assumed backfill geometry and loading conditions are not met.

6. **Consistency Across Plan Sets**

   a. The group discussed the inconsistent treatment of some items such as geotextile fabric with it showing as incidental on some plan sets and as a pay item on others. An example was one project had four bridges designed by three different consultants.
Each plan set treated geotextile fabric differently, which led to confusion by the contractor. Ryan Gossom suggested that if it was included as a pay item, it was more likely to be included; some contractors might be more inclined to omit the fabric if it was considered incidental if an inspector was not present.

b. The group discussed whether an item should be designated as a pay item or incidental on general notes or plan notes. In general, the group expressed a preference to use general notes, however it was noted that supplemental plan notes have been requested at times to address specific problems that have arisen on other projects.

7. **Constructability Reviews** – The sub-committee inquired if it would be feasible to conduct constructability reviews on Stage 1 Final submittals rather than Stage 2 Final. This would allow time to address concerns raised during the constructability review and would eliminate the need to make an additional submittal following Stage 2 Final. Brent Sweger indicated that he would like to be able to conduct constructability reviews all on projects once he has sufficient review staff. He stated that he was willing to perform reviews on Stage 1 Final submittals if there was sufficient time between the submittal and letting.

8. **ORB Lessons Learned** – The sub-committee inquired if there were any lessons learned from the ORB project that could be shared at that time. It was noted that Jeremiah Littleton had intended on attending the meeting but was unable to due to the opening of the downtown river crossing. As a result of issues that arose during the course of the project, Section 607 of the specifications (Structural Steel Bridges) will be revised during the next spec book update. Most of the updates will account for modern fabrication technologies that are not included in the current specs.

9. **Future or New Changes in Procedures/Closing Thoughts**

   a. Mark Walls noted that he was aware of multiple bridges built recently without concrete diaphragms at the piers. Mark Hite stated that his office has been experimenting with the concept of simple spans for live load by using a “link slab” over the pier. The group discussed several ways of managing transverse cracks that tend to form in link slabs. John Broadus noted that they have made use of a Texas DOT detail that utilized a preformed joint filler over piers; he indicated he would forward the detail to Mark Walls for review. Some contractors have expressed a preference for sawcutting the link slab.

   b. On phased construction projects there seems to be inconsistency in the use of an epoxy bonded construction joint. Mark Hite stated that this is covered in the notes and specifications.

   c. Mark Hite reminded the consultants that KYTC has several precast beams that are available for use on projects. The replacement span on the Eggners Ferry Bridge will also soon be available for reuse (320’ long by 22’ wide). Information on the beams and truss will be included with these minutes for distribution.
10. **Future Meetings** – The next meeting would be in Spring 2016 with the Division of Maintenance, which will be followed by the annual meetings with the Division of Structural Design and the Division of Construction.
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GENERAL NOTES

FRICTION COEFFICIENT AT 68°F BETWEEN THE SLIDING SURFACES. TO THE EXISTING PIER 6. SELECT A BEARING WITH A 4% MAX. SLIDING TYPE TO MINIMIZE THE LONGITUDINAL FORCE TRANSFERRED.

THE NEW TRUSS EXPANSION BEARINGS SHALL BE A LOW FRICTION BEARING TYPE MANUFACTURED BY DS BROWN.

NEW TRUSS BEARINGS
MAXIMUM UNFACTORED LOADS PER BEARING

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<td>350 / 150</td>
<td>40</td>
<td>15</td>
<td>0.0159 / 0.0176</td>
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THE NEW TRUSS EXPANSION BEARINGS SHALL BE PLACED AS REQUIRED TO MINIMIZE THE LONGITUDINAL FORCE MANUFACTURED BY DS BROWN.

EXPANSION: UNI-DIRECTIONAL VERSIFLEX HLMR BEARING PMG-550

FIXED: FIXED VERSIFLEX HLMR BEARING PF-550

THE NEW TRUSS BEARINGS SHALL BE POT BEARINGS MANUFACTURED BY DS BROWN.

PROVIDE 3" DIAMETER PIPE DRAINS AT MID-PANEL ALONG EACH GUTTER LINE. MATERIAL SCUPPERS

BILLET-STEEL BARS (ASTM A615) OR LOW ALLOY DEFORMED BARS (ASTM A706).

PROVIDE GRADE 60 REINFORCEMENT BARS THAT MEET THE REQUIREMENTS OF DEFORMED REINFORCEMENT BARS AS SPECIFIED IN THE CURRENT AASHTO SPECIFICATIONS.

EPOXY COAT ALL REINFORCEMENT BARS.

REINFORCEMENT BARS

ALL DIMENSIONS ARE HORIZONTAL EXCEPT AS NOTED.

SUPERSTRUCTURE DIMENSIONS ARE FOR A NORMAL TEMPERATURE OF 60°F.

DO NOT USE FORM SUPPORT SYSTEMS THAT WILL CAUSE UNACCEPTABLE OVERSTRESS TO PERMANENT BRIDGE MEMBERS.

ALL REMAINING STRUCTURAL STEEL EXCEPT FOR CONNECTION ANGLES SHALL MEET THE SUPPLEMENTAL REQUIREMENTS FOR NON-FRACTURE CRITICAL MEMBERS IN TABLE II (AASHTO M270) FOR ZONE 2.

AND ALL FLOOR BEAM ROLLED SHAPES, SHALL MEET THE SUPPLEMENTAL REQUIREMENTS FOR FRACTURE CRITICAL MEMBERS IN TABLE II (AASHTO M270) FOR ZONE 2.

STRENGTH BOLTS, NUTS AND WASHERS UNLESS NOTED OTHERWISE.

BOLTED CONNECTIONS SHALL BE 1" DIA. MECHANICALLY GALVANIZED ASTM A325 HIGH

GALVANIZED.

STEEL THRIE BEAM RAIL, POST, CRUSH TUBES, AND HARDWARE SHALL BE HOT-DIPPED

GALVANIZED.

ALL STRUCTURAL STEEL IS TO RECEIVE A PRIME COAT OF PAINT IN THE SHOP PRIOR TO SHIPMENT.

STEEL THRIE BEAM RAIL, POST, CRUSH TUBES, AND HARDWARE SHALL BE MECHANICALLY

GALVANIZED.

STEEL CONNECTIONS SHALL BE THREADED MECHANICALLY GALVANIZED ASTM A325 WITH

STRENGTH BOLTS, NUTS AND WASHERS UNLESS NOTED OTHERWISE.

TRUSS MEMBERS IDENTIFIED AS FOR, ALL MAIN GUSSET PLATES, ALL SPLICE PLATES, AND ALL FLOOR BEAM ROLLED SHAPES, SHALL MEET THE SUPPLEMENTAL REQUIREMENTS FOR NON-FRACTURE CRITICAL MEMBERS IN TABLE II.

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PROVIDE WELDED STUD SHEAR CONNECTORS MANUFACTURED FROM STEEL CONFORMING TO

(AASHTO M270) FOR ZONE 2.

PROVIDE WELDED STUD SHEAR CONNECTORS MANUFACTURED FROM STEEL CONFORMING TO

ASTM A108.

OTHER STEEL COMPONENTS ARE DESIGNED IN ACCORDANCE WITH THE CURRENT AASHTO


STEEL TRUSS MEMBERS ARE DESIGNED BY THE LOAD FACTOR METHOD IN ACCORDANCE

WITH AASHTO GUIDE SPECIFICATIONS FOR STRENGTH DESIGN OF TRUSS MEMBERS, 1985,

WITH THE INTERIM GUIDE SPECIFICATION 1986.

SLIP-CRITICAL CONNECTIONS ARE DESIGNED FOR CLASS B SURFACE CONDITIONS IN

ACCORDANCE WITH THE CURRENT AASHTO SPECIFICATIONS.

CLASS "A" CONCRETE TO BE USED FOR BEARING PEDESTALS AND REPAIR WORK ON

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