MINUTES OF DOT-AGC BRIDGE DESIGN SUBCOMMITTEE MEETING

(Approved: 02/15/12)

The DOT-AGC Joint Bridge Design Subcommittee met on December 7th, 2011. Those in attendance were:

Greg Perfetti	State Bridge Design Engineer (Co-Chairman)
Berry Jenkins	Manager of Highway Heavy Division, Carolinas Branch AGC (Co-Chairman)
Mike Robinson	State Bridge Construction Engineer
Chris Peoples	State Materials Engineer
Allen Raynor	Assistant State Bridge Design Engineer
Randall Gattis	Sanford Contractors, Inc.
Chris Britton	Taylor & Murphy Construction Co.
Ben Bishop	Lee Construction Co.
Larry Cagle	Thompson-Arthur Div., APAC-Atlantic, Inc.
Dan Nickel	Carolina Bridge Company
Jonathan Bivens	S.T. Wooten Corp.
Lee Bradley	Blythe Construction
Mark Johnnie	Balfour Beatty
Adam Holcomb	Dane Construction, Inc.
Brian Hanks	Structure Design Project Engineer
Paul Lambert	Structure Design Project Engineer
Scott Hidden	Support Services Supervisor – Geotech. Eng. Unit
Paul Garrett	State Bridge Program Manager
Jeff Garland	State Value Management Engineer
Gichuru Muchane	Structure Design Engineer

The minutes of the August 10, 2011 meeting were reviewed and approved.

The following items of new business were discussed:

1. *Backfill for MSE Walls*

   Mr. Hidden stated that historically fine aggregates have not been used for backfill in Mechanically Stabilized Earth (MSE) retaining walls due to concerns with corrosion of the steel reinforcement straps used in the MSE wall system. However, the recently published NCHRP Report 675 presents findings of research conducted to develop metal loss models for metal-reinforced systems that are compatible with the *AASHTO LRFD Bridge Design Specifications*. The report addresses corrosion rates of MSE wall systems and ground anchors. Based on the models presented in this report, the Geotechnical Engineering Unit initiated a study to develop State specific corrosion rates for aggregates specified in the *Standard Specifications*. Mr. Hidden reported that the results of this study have been implemented through revisions to the special provision for Mechanically Stabilized Earth Retaining Walls.

   Mr. Hidden distributed a copy of the revised special provision and he highlighted the revisions, which are summarized as follows:

   - No substantial changes to the requirements for coarse aggregate. Coarse aggregate conforming to the requirements of the *Standard Specifications* will not require electrochemical testing.

- Contractors will have the option to use coarse or fine aggregate in the reinforced zone of MSE walls except that fine aggregates may not be used for walls subject to scour, walls supporting or adjacent to railroads, walls over 35 ft. or walls with internal acute corners less than 45^{o}.
- Fine aggregate must be from an approved source. Due to higher corrosion rates associated with fine aggregates, electrochemical testing will be required when fine aggregate is used for walls with steel reinforcement or connectors. The fine aggregate must meet pH, resistivity, chloride, sulfate and organic content requirements. Fine aggregate used for walls with geogrid reinforcement requires pH and organic content testing only.

2. *Reinforced Bridge Approach Fill Details*

   Mr. Perfetti stated that concerns with the drainage affecting the performance of the reinforce bridge approach fill have been expressed by maintenance personnel in some regions of the State. Accordingly, the Structures Management Unit is employing the subregional tier stone backfill detail, rather than the reinforced approach fill, on a few girder bridges on a trial basis.

   Mr. Hanks added that in the future Structures Management will evaluate the reinforced bridge approach fill details for improved drainage performance.

3. *Standard Overhang Bracket Spacing*

   Mr. Lambert stated that the Structures Management plans to offer Contractors the option to utilize standardized overhang falsework hanger spacing for AASHTO Type II, III and IV, and 63" and 72" MBT prestressed concrete girders. He added that the standard spacing would be based on the safe working load of commonly used/available hangers and brackets. He solicited Contractor feedback on typical bracket spacing, falsework hanger working load, and bracket strength. Mr. Lambert added that the standardized design would not be applicable for staged construction and other criteria limiting the use of standard hanger spacing option, such as overhang geometry and screed wheel loads, would be provided.

   Contractors were in favor of standardizing overhang falsework hanger spacing. However, they requested Structures Management maintain the Contractor's option to submit their own design. During the discussion Contractors also requested to be informed of any developments during review of the concrete producer's working drawings.

   There was some discussion on standardizing the overhang hanger hole location in the top flange of modified bulb-tee girders. Mr. Lambert noted that the offset of hole the from the edge of the top flange varies on occassion. He stated that he would review previous submittals and propose a standard offset for Contractors' review and feedback.

4. *Bridge Program*

   Mr. Garland gave a presentation on the State Funded Bridge Improvement Program. He discussed the legislative initiative to commit $450 million in State funds for improvements to structurally deficient bridges for the 2011-13 fiscal years. He noted that the primary goal of utilizing the allocated funds is to improve the overall bridge health index by delivering as many bridge replacement, rehabilitation and preservation projects as the funds will allow. As such, approximately 1200 bridges have been identified as being affected in the fiscal years.

   Mr. Garland discussed the planning and coordination required to meet the aggressive initiative. He noted that the Department will rely on Private Engineering Firms (PEFs) to provide engineering and design in all disciplines, including Traffic Control, Erosion Control and Construction Engineering Inspection. He added that design-build contracts and turnkey design contracts will be the two primary methods for letting the work.

The new express design-build contracting method will be used for projects with a narrow scope of work, e.g. small bridges or spot safety upgrades. Express design-build contracts will be awarded to the lowest bidder, with no requirement for a technical proposal or presentation, which should facilitate rapid procurement and delivery. The scope of work for express design-build projects was discussed, in broad terms, as well as a brief overview of the procurement process and procurement time.

Turnkey design for 186 bridge replacement projects are part of the overall project delivery strategy. Twenty-six groups of bridges in eleven (11) Divisions have been advertised and will be awarded to separate PEFs, including Small Professional Services Firms (SPSFs).

Mr. Jenkins remarked that the success of the State Funded Bridge Improvement Program will demonstrate to the State General Assembly the ability to rapidly deliver bridge projects and will be the basis for requesting steady funding for future projects.

5. *Precast Elements for Temporary Bridges*

   Mr. Robinson stated that the precast elements, such as deck panels are sometimes used on temporary bridges for traffic. He noted that the Department currently has no policy on the use or re-use of precast elements for these types of temporary bridges.

   Mr. Robinson informed the Contractors that the Department is developing a policy on the use of Contractor designed precast elements for temporary bridges. In general, the policy will address issues such as quality control, records retention for testing, source, and piece marking methods for elements that will be used on future projects. In addition, elements and materials used in the past will be subject to inspection, as well as elements that are permanently incorporated into the project.

6. *Elastomeric Bearings*

   Mr. Robinson stated that the substandard condition of elastomeric bearings delivered to a recent project prompted inspection of bearings from the same manufacturer on several other projects. The findings revealed a substantial number of substandard bearings from the same manufacturer. He briefly described some of the symptoms exhibited by the substandard bearings, which included exposed and misaligned internal shim plates, and excessive and asymmetric bulging. Contractors were encouraged to ensure they receive good quality bearings and they were advised to submit bearing certifications prior to setting bearings.

   Mr. Peoples informed Contractors that the manufacturer in question has been disqualified from supplying bearings to the Department. He stated that the Materials and Tests Unit has visited the manufacturer's production facilities and the investigation is currently in an information gathering stage, and added that minimizing the impact to project schedules is a priority.

7. *NC-12 Temporary Bridge and Roadway Repairs*

   Mr. Robinson provided a brief update on the progress of roadway repairs to NC-12. He noted that most of the repairs are being documented on the Department's social media (Flickr, YouTube, and Twitter) web sites. The Committee was invited to follow progress of the repairs through the publicly available channels.

8. *State Structures Management Overview*

   Mr. Perfetti briefly discussed the merger of the former Structure Design and Bridge Management Units into the new Structures Management Unit. He provided a brief overview of the functions and organization of the Unit. He noted that submittals for bridge preservation projects will be reviewed by Structures Management.

   Contractors inquired how bridge preservation contracts would be administered with respect to insurance bonding and disadvantage business enterprise (DBE) requirements. The discussion noted that project requirements, such as DBE goals, would be explicit in the proposal.

9. *Standard for Foam Joint (Evazote) Repair and Rejection*

   Mr. Nickel inquired if the Department has developed criteria or standards for evaluating evazote joint failures.

   Mr. Robinson responded by first stating the number of joint failures throughout the State have prompted revisions to the requirements for the joint material and bonding adhesive. The revised requirements are listed in the special provision for Foam Joint Seals. He added that the Inspectors have been trained on defects that warrant repairs and conditions that require joint replacement.

   Mr. Nickel also inquired if Contractors can contest the requirement to repair or replace a joint during the warranty period. Mr. Robinson responded by stating that the Inspectors take the manufacture's repair procedures into consideration when determining whether repair or replacement is warranted. He added that fewer joint failures are anticipated for joint seals that meet the revised requirements.

10. *Other*

    i. PDA Results

       Contractors stated that when a Pile Driving Analyzer (PDA) test is required, it may take up to a week to receive approval to proceed with pile driving activities. They inquired if approval can be granted in a more reasonable amount of time.

       Mr. Hidden responded by explaining the current process of analyzing the PDA data, developing the PDA report and establishing the pile driving criteria. He noted that this process justifies the 10 days allowed by the *Standard Specifications*, for PDA test result review and approval.

11. *Next Meeting*

    The next meeting is scheduled for Wednesday, February 15, 2012 in the Structure Management Conference Room.