

Georgia/C Carolinas PCEF Committee Meeting #20

GDOT, Atlanta, GA

February 8, 2018

MINUTES

1. Welcome & Introductions

At 10:00 AM, Committee chair Reid Castrodale began the meeting by welcoming those present and attending by phone. He acknowledged Romeo Garcia from FHWA who has agreed to serve as co-chair. Self-introductions were made by the attendees in the room and those who joined remotely via GoToMeeting. A sign in sheet was circulated. (Attendee list is attached.)

2. Review & Approval of Minutes – August 17, 2017 Meeting at SCDOT

A motion was made and seconded to approve the minutes as distributed. Passed.

3. Review of Agenda

The agenda for the meeting was reviewed. No modifications were made.

Aly Hussein questioned the indication on the minutes that the next meeting would be in SC. Reid Castrodale reviewed the decision at the last meeting that the committee wanted a face to face meeting each year. This is currently only practical in Columbia, so it was agreed to hold summer meetings in Columbia but alternate between GA and NC for the meetings in February.

The meeting agenda, minutes, presentations and other documents will be posted on the G/C PCI website at: <http://www.gcpci.org/index.cfm/technical/pcef>.

4. Informational – Updates from FHWA, SCDOT, GDOT, NCDOT, PCI & G/C PCI

Each agency and organization attending gave an update:

FHWA – Romeo Garcia gave the FHWA update using some slides, which have been posted on the website. In the update, he discusses the NHI Bridge Construction Inspector training, a bridge bundling guidebook (Bill DuVall had been interviewed, and SC was to be interviewed very soon), specifications for full-depth precast deck panels, several training modules developed by PCI, some post-tensioning related resources, and results of a domestic scan on creating and maintaining construction inspection competence (report is available at domesticscan.org). Regarding full-depth deck panels, Romeo was especially interested in guidance about acceptable quantity and widths of cracks and methods for repair. Bill DuVall indicated that GDOT has no specific criteria regarding quantity and size of cracks. DOTs have an opportunity to get a project with electronically isolated tendons (EIT) where FHWA will fund delta costs for this technology. The technology is currently being used for a project in PA.

GDOT – Bill DuVall reported that they are considering use of Florida I-Beams (FIBs) and are working toward how to use them. They currently designing some for a project that should come out later this year. Several design/build projects have already used FIBs, so they will not prevent their use. He described a recent project where they allowed, although reluctantly, top strand debonding in the shop drawings to address handling stresses. The design camber was 3.5 in., but after the top strands were detensioned, there was only 1 in. of camber. This was a problem because the girder was expected to have a negative camber (maybe 2 in.) after the deck was placed, which may make an issue for vertical clearance. Brian Hanks mentioned that they had a similar situation for a bridge and have been monitoring the bridge, so they will have documentation of the negative camber if future concerns are raised. The discussion moved into camber prediction, where Brian mentioned the camber program that is now being used which seems to be working well since they have not received notice from the Construction Unit that cambers are out of range with the predicted values. The program adjusts both the modulus of elasticity (85% of expected) and the concrete strength (120% of

specified), based on the data collected during development of the program; these factors apply to all plants and all types of sections. NCDOT policy requires that the program be used for computing camber. The program and Dr. Zia's report should be available on the NCDOT website. [provide link to policy memo in minutes]

Link to the NCSU research report:

<https://connect.ncdot.gov/resources/Structures/Documents/NCSU%20Final%20Report%20-%20Predicting%20Camber.pdf>

Link to the camber spreadsheet (requires a login to Connect NCDOT):

<https://connect.ncdot.gov/resources/Structures/Documents/Prestressed%20Concrete%20Girders%20-%20Refined%20Method%20for%20Camber.xlsx>

Link to NCDOT Bridge Resource Documents – see links for “Prestressed Girder Camber.”

<https://connect.ncdot.gov/resources/Structures/Pages/Structure-Resources.aspx>

Bill DuVall mentioned that they are requiring a minimum 500 psi difference between the minimum specified concrete compressive strength at transfer and the strength at 28-days.

the option for 7 in. webs is now allowed for projects. He mentioned that they like concrete diaphragms, but that contractors like steel diaphragms. They are using steel diaphragm details based on the NCDOT steel diaphragm details, with K-braces for bulb-tee girders.

Bill reported that they are taking a closer look at the FIB sections in their Consultant Structural Committee.

He mentioned that the bridge move in north GA was completed in 81 hours, while 56 hours was in the contract. He also reported that the Courtland Street Bridge replacement design/build project has been awarded to the same contractor that did the I-85 emergency replacement. Their concept was to use concrete girders conventional construction rather than launching steel girder superstructures, as was presented in the preliminary plans.

They currently have 13 local design/build projects. They also are moving forward with their Low Impact Bridge Program, which is similar to the program in NC. They are doing the designs in-house to keep staff busy. They expect about 17 of these projects per year, and he hopes that the projects will continue at this pace into the future.

Bill mentioned that their typical program had been \$80M to \$100M per year, but they are now expecting over \$200M next year, so the program will be doubled.

Bill also reported that Melissa Harper has retired, and that the construction office has been restructured. Mike Garner is now the Bridge Construction Liaison.

SCDOT – Terry Koon gave a report. SC is now ramping up their bridge program. Structures Division is now going to be responsible for the design of maintenance bridges. They also have a new low volume roads program. Steve Nanny indicated that the new gas tax is being phased in gradually. This allows the program to grow gradually, so the industry will also be able to grow to provide the additional capacity to meet the increased demand. A single-span deck girder bridge project is scheduled to bid in February.

NCDOT – Brian Hanks reported that the reorganization of the Department has been their recent greatest focus. The Divisions are now putting out their own projects, with the Central office being responsible for bridges on the primary and interstate systems.

As they continue to fill positions, he mentioned that Cabel Garvey is now the Manufactured Products Engineer, and he will cover all manufactured products, including precast concrete, prestressed concrete, pipe and steel girders. They are still looking for a replacement for Trudy, who will be the Concrete Products Engineer, and will be responsible for prestressed concrete, precast concrete and concrete pipes. They are still looking for a concrete mix design engineer and inspectors. They are using CE&I firms for inspections where needed.

PCI – William Nickas reported on a number of PCI activities, including an agenda item being considered by AASHTO T-10 on proposed revisions to the AASHTO LRFD provisions on debonded strands; use of lump sum losses in some

cases; eLearning courses under the FHWA contract, which will have first courses live in the next few weeks; spreadsheet is being developed for lateral stability calculations and should go to PCI ballot in October; a bridge geometry design course will be balloted soon and will be piloted in MN and OH; the curved spliced u-beam report is out for ballot and it close to being ready for publication; and a handout with several articles that appeared in the Winter 2017 issue of *ASPIRE* magazine related to grouting of post-tensioning tendons.

Peter Finsen reminded attendees that the PCI Convention and National Concrete Bridge Conference would be held in Denver, CO on February 20-24, 2018. He also distributed a list of free PCI publications that will be available very soon from the PCI website. This will be in conjunction with the release of the new PCI website.

G/C PCI – Peter Finsen reported that the GDOT Prestressed Concrete Bridge Design Seminar was held on April 19 with just over 100 attendees. The seminar featured Glenn Myers from Atkins as the instructor on lateral stability.

5. Materials, Fabrication and Construction

5.a Accelerated Construction *Informational Item*

Lead: Bener Amado..... *William Nickas, Reid Castrodale*

Bill DuVall reported on a few more items related to ABC. They have tried to encourage use of precast columns, but the contractors VE'd them out. They have a project where it is designed to have the deck cast on the girders at the site prior to erection, with girders in proper location and foam used to form the joints between deck sections. Then, after erection of the decked units, the joints between units will be filled with UHPC. They find that they have to force the contractors to use UHPC. Bill said that the material is incredible when you see it in place – it is just like a ceramic.

William Nickas related the story from an early use of UHPC in Iowa where the contractor did not provide water-tight forms, and much of the UHPC simply drained out of the forms – an expensive problem. This gave UHPC a black eye in the area. But these issues just need to be figured out.

In South Carolina, they will be replacing a lot of bridges in the next few years. They figure that about half will be cored slabs on low volume roads. Initial plans will probably hit the street in about 5 years – may be about 20 projects this year; but will be about 60 in 4 years. The state has 470 load posted or closed bridges out of about 9200 bridges. There are a lot of the short span (15 ft) bridges with 9” precast slabs that are now in need of replacement. The Bridge Office is now doing maintenance bridges so there will be a single standard. The Bridge Office will be looking for long-term solution (75 yrs) rather than just fixing a problem for the short term.

In North Carolina has an option for precast, prestressed concrete caps for ABC. They let a lot initially, but interest has died down recently.

William Nickas suggested that the DOTs use permit vehicles to check new designs at Strength II limit state. NCDOT is currently do this.

Action item(s) completed:

New action item(s):

5.b Reciprocity for Certifications and Other Issues *Active Item*

Lead: JR Parimuha..... *Chris Peoples, Aly Hussein, Ken Foster, Gary Shrieves*

No discussion.

William Nickas suggested that NCDOT standard cored slab designs could be taken to SC for their consideration.

Action item(s) completed:

New action item(s):

5.c Tolerances *Active Item*

Lead:

No discussion.

Action item(s) completed:

New action item(s):

6. Parameters and Standardization

6.a Precast Pavements [approach slabs] Informational Item

Lead: Brian Hanks

It was asked if DOTs use precast approach slabs – SCDOT does. SCDOT has done a project with precast approach slabs with Paul Ziehl at USC. No other DOTs expressed interest in approach slabs. William Nickas indicated that PCI will be publishing a design guide and spreadsheet for precast pavements that may be useful for approach slabs. However, the design approach assumes that the panels are fully supported by soil below.

Industry had made no progress on developing details for connecting and setting approach slabs.

Action item(s) completed:

New action item(s):

6.b Full-Depth Bridge Slabs Informational Item

Lead: Brian Hanks Bill DuVall

Bill DuVall reported on their recent project with precast decks with UHPC closure joints. They were pleased with the results. They intend to show estimated quantities of UHPC on future projects. The panels used a blind detail to connect with the girders. The contractor ground the UHPC joints in 2 passes. The contractor could not get the leveling bolts to back out after the UHPC was placed. The contractor did not seem to have any problems grinding the UHPC.

William Nickas noted that when the precast panel gets large enough, cracking may be an issue due to restraint. At that point, which seems to be about 200 SF, the panels should be prestressed.

May still inviting Eddie He to give a presentation on the AccelBridge system. Richard Potts had investigated the construction approach and thought it was interesting.

Action item(s) completed:

New action item(s):

6.c Process Standardization Various

Lead: Jeff White

The following issues were discussed.

6.c.1 RFID/Bar codes for precast products Active Item

A presentation was given by Idencia (Jeff Pollack and Randy Pace – consultant) with contributions by Todd Whittington from NCDOT at about 12:30 (on G/C PCEF website).

Action item(s) completed:

- Presentation on implementation by NCDOT and system supplier Todd Whittington

New action item(s):

6.d Reinforcement Details Active Item

Lead: Richard Potts Reid Castrodale

Richard Potts is doing some work on details for varying stirrup projections and will work to develop recommendations. No DOTs indicated any details that they like for the varying projections. Bill DuVall asked how the other DOTs were dealing with varying projections. Richard reported that if the design requires a lot of bar

marks to account for the camber, there may be a lot of waste since they typically order 5% extra for each bar mark to cover eventualities. He also reported that contractors want prebent bars for labor and safety reasons. All tolerances need to be considered in setting up the details.

It was noted that at least one state (LA?) may detail a ‘‘recovery’’ bar which is to be used if the camber doesn’t come up. Bill DuVall asked if there was any research that indicated the effectiveness of the hat bar detail. William Nickas suggested that the horizontal shear provisions in the LRFD Specifications are so conservative that this is not an issue.

William Nickas reported that T-10 has an agenda item that includes allowing the use of debonded temporary top strands to control stresses at the end of girders. He thinks that it will pass in 2018. Top strands also improve lateral stability. Different producers will have different abilities to use temporary top strands, depending on the capacity of their prestress beds. He encouraged the DOTs to look at the agenda items when it comes out. It will be helpful for prestressed girders to achieve lengths of 209 ft, the maximum current maximum, to 230 ft, which is being considered. While FIB standards did not initially include temporary top strands, they are now being allowed.

Action item(s) completed:

New action item(s):

- Find out if supplementary bars provide required composite connection to girder Castrodale/Nickas

6.e **Girder Shapes** *Active*

Lead: Reid Castrodale *Gary Shrieves*

No discussion, other than presentation on lateral stability by Anthony Mizumori with WSDOT (on G/C PCEF website).

WSDOT practice is for the designer to consider lifting from the bed and placement on the truck for hauling. There are 2 loads cases for hauling which consider a stopped truck on a 2% cross-slope with wind and vertical impact, and a 6% cross-slope with no impact or wind. These checks are performed by the free program PGStable. The contractor remains responsible for lifting and hauling.

William Nickas commented after the presentation was completed that WSDOT is probably the DOT that is farthest along in considering lateral stability in the US. In WA, hauling is the responsibility of the contractor, not the producers. The DOT works closely with the producers and haulers to establish their practices, and they have served them well, allowing them to successfully haul and erect some of the longest bridge girders in the US.

Action item(s) completed:

- Invite Rick Brice with WSDOT to give presentation on their approach to topic Reid Castrodale

New Action item(s):

6.f **NEXT Beam** *Active*

Lead: *Bill DuVall*

Terry Koon gave a brief presentation on their recent project with the modified NEXT beam with UHPC joints (on G/C PCEF website). Since the bridge was going to receive an asphalt overlay, the joints were just cast flush rather than using a chimney. Load testing was performed, but results were not presented.

Action item(s) completed:

- Presentation on project with modified NEXT beams SCDOT

New Action item(s):

6.g **Precast Substructure Elements**..... *Informational*

Lead: *JR Parimuha*

Precast pile caps

No discussion.

Action item(s) completed:**New Action item(s):****Precast substructures**

No discussion.

Action item(s) completed:**New Action item(s):****7. Brainstorming / Strategic Discussion**

Peter Finsen introduced the brainstorming session with an brief review of the background of the committee. A history of the committee was distributed, which included the minutes from the initial meeting, and a list of actions taken and presentations given at previous meetings.

Reid Castrodale then pointed out that while this committee has produced several standards, much of the focus of the committee has been on the exchange of information between the states and industry, such as the presentations at this meeting. The mission and goals of the committee shown in the history document are still valid.

William Nickas indicated that the list of accomplishments was impressive. He asked if any of the items needed to be updated.

Reid Castrodale asked the DOTs for their perspective on the committee activities.

Bill DuVall reported that GDOT is moving toward implementation of additional items, such as the 7 in. web and bearing plates. He also mentioned the value of the PS Design Seminar held in April. He also said that he felt that holding one face-to-face meeting a year would be useful.

William Nickas suggested that seminars could cover best practices and uniform detailing. Welded wire is an example, getting understanding and in approval advance, rather than after the project is bid. He also suggested implementation of the strut-and-tie model, although this is not limited to prestress concrete applications. The DOTs were interested in the training. Peter Finsen pointed out that the G/C PCI seminars have recently focused more on design and detailing issues that affect fabrication.

Aly Hussein encouraged the development of more training for engineers regarding the production of prestressed concrete girders. It was agreed that communication and education regarding best practices are very important for the bridge engineering community.

Some other topics that were mentioned included: repair procedures, identifying the differences between each set of DOT standards; when to debond and when to harp; full-length debonding of strands; treatment of ends of girders; use of same concrete mixes for all states; standardization of straight debonded strands for plant safety; camber management plan; and soundwalls.

It was agreed that it would be ideal for plant practices and design practices that affect the plants to be uniform between the states.

8. Next Meeting Date & Location

Thursday, February 15, 2018 (10 am – 4 pm), at GDOT

Thursday, August 16, 2018 (10 am – 4 pm), at NCDOT

Adjourn

The meeting was adjourned at 4:00 PM.

ATTENDEES: G/C PCEF Committee Meeting – February 8, 2018 at GDOT

		<u>Name</u>	<u>Company</u>	<u>Phone</u>	<u>Email</u>
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