

NCDOT - G/C PCI Joint Meeting Minutes

Thursday, March 29, 2018; 1:30pm

1. Cabell Garbee, chair of the meeting, welcomed attendees.

Self-introductions were made. The following attended the meeting.

Brian Hanks	NCDOT – SMU	bhanks@ncdot.gov
Trey Carroll	NCDOT - SMU	thcarroll1@ncdot.gov
Madonna Rorie	NCDOT – SMU	mrorie@ncdot.gov
James L. Bolden	NCDOT – SMU	jlbolden@ncdot.gov
Chris Peoples	NCDOT – MTU	cpeoples@ncdot.gov
Cabell Garbee	NCDOT – MTU	cgarbee@ncdot.gov
Jason E. Poppe	NCDOT – MTU	jepoppe@ncdot.gov
Peter Finsen	G/C PCI	peter.finsen@gcpci.org
Reid Castrodale	Castrodale Engineering / G/C PCI	reid.castrodale@castrodaleengineering.com
Jeff White	Prestress of the Carolinas	jeff.white@prestressotc.com
Travis Overcash	Utility Precast	utilityprecast@hotmail.com
J. R. Parimuha	Florence Concrete Products	jrparimuha@yahoo.com
Chris Arca	Coastal Precast Systems	carca@cpsprecast.com

Minutes are presented in the order in which topics appeared in the agenda rather than in the order of discussion.

2. Approval of last meeting minutes. The minutes of the November 16, 2017 meeting were approved as submitted.
3. Old Business
 - a. RFID/Barcode Information

Bobby Watkins was not able to attend the meeting. Cabell Garbee discussed the current status from the perspective of NCDOT. They have a team from M&T and HICAMS working on the situation since it seems to work well some days and not so well on others. Tracy Johnson has left NCDOT HICAMS to be a customer service representative for Idencia, so Cabell thinks that may be a positive step. Issues are still being encountered for people trying to make Titan and Idencia work together. Titan does not seem to be responsive. SCDOT and VDOT have both been interested in pursuing a similar system.

Jeff White suggested adding a second vendor for the system because his plant has not had a lot of success with the system and they can charge what they want for the tags. Cabell reported that their system is set up to be able to work with any vendor. They do like the current tags which can be read 3 ways – RFID, barcode and a visual number – but that combination is apparently patented.

Jeff White indicated that his QC Manager is spending a lot of time on the system, but it still isn't working. He was told to change the mix design designations for 6 months, but after the change, the system still didn't work. Chris Arca also said that half of his QC Manager's time is going to Idencia issues. Cabell told them to call him and Jason when they have such problems because they do not want the process to take so much time for plant staff. He hopes that Tracy will be able to help the process go more smoothly.

It was agreed that it would be helpful to have a meeting with Idencia and Titan to work out some of the issues that exist. Producers were encouraged to develop a list of issues they are having that need to be resolved.

b. Top Strands

Trey Carroll reported that they are still looking at the issue. They are currently short staffed. They are currently trying to rewrite the entire chapter of the design manual. PCI offered to provide information if needed. Reid Castrodale reported that there is an AASHTO agenda item that would address this topic.

There was also a discussion about top strands in typical girder designs. Jeff White recently received the standard strand pattern for FIB girders and did not see anything about the top locations for draped strands. Trey responded that there is a note in the Design Manual that addresses that issue.

There was further discussion about providing slack strands in the top of girders. SCDOT mandates two strands for tying stirrups, but they are not required by NCDOT. NCDOT was reluctant to require the added strands in case some producer has figured out a way to make girders without them. In some cases, when precasters add the slack strands in the shop drawings, they are not allowed because designers say it will affect their design. When draped strands are high enough in the section, or other strands are up in the web, those strands can be used to tie to stirrups and the top strands are not required, but that would be difficult to write into the Design Manual guidance. All producers present add the strands. Only in very rare cases would they not add the strands.

c. Status of Florida I-Beam (FIB) Use

Trey Carroll reported that they are still working on the FIB girders. They know that FIBs are being used on some projects. Trey expects that if consultants approach the Department asking to use FIBs they will probably get approval. He was not aware of any policy that has been set. They are still working on the standard reinforcement for the shear steel at ends of girders. The strand pattern has been determined which will have 2 strands in the web rather than 3 potential strands for the FDOT standards.

d. Web Splitting – Debonding Quantity and Silane Sealing

Reid Castrodale expressed concern about the current policy of 50% debonding if there is web splitting. He reported that PennDOT uses 50% debonding, but only for 6 in. from the end. Concern was also raised that the specifications require use of the 50% debonding only if web splitting is observed. However, if a project has only a few pours for a given girder configuration, cracks may not be visible until after all of the girders have been fabricated. They will continue to look into this. Trey was interested in any alternative to the current procedure.

e. Welded Wire Reinforcement Standards

NCDOT is looking at the FDOT standards for FIBs that have an option for welded wire reinforcement. They may allow wire reinforcement for other girder shapes as well. Trey was not sure if they would allow use of the higher strength of wire reinforcement in shear calculations.

f. Reduced Rubbing of Girders

Peter Finsen read a proposal from John Smith at GDOT to address the problem of rubbing, which was to wet sack all girders as currently doing, making certain to be consistent with the sack rubbing material, is consistent, and then leaving the sack rubbing material on the girders with no additional rubbing. This should fill all minor surface imperfections and provide a uniform color without causing the problems with dust that dry rubbing creates. Jason Poppe was agreeable as long as the girders had uniform color. No one has tried the proposed procedure yet. JR Parimuha indicated that they are currently wet rubbing but leave it rough since they come back and dry rub. With the single pass procedure, they would try to make the wet rub finish better. Chris Peoples recognizes the problem and wants to work with fabricators to

minimize the problems. He recommended that the Department pilot the revised procedure and get feedback. It was agreed that fabricators would contact Jason and he would let the inspectors know that they would be trying the single pass procedure.

g. Lateral Stability of Girders

Trey Carroll reported that he had seen the AASHTO ballot related to lateral stability. The NCDOT IT folks are working on implementing lateral stability into the NCDOT PS girder design program. Trey Carroll asked about the status of the spreadsheet for the PCI lateral stability method. Reid Castrodale was not sure of the current status. Consultants will not have access to the NCDOT design program, so will need to perform their own calculations. Trey Carroll mentioned that he had some concerns about Conspan's lateral stability calculations – they don't seem to include debonding in the calculations. Reid Castrodale agreed to send a link to the website with the WSDOT design program PGSuper.

Trey indicated that NCDOT is currently looking at having designers consider stability when girders are lifted from the bed, but not during transportation. At lifting, they are checking stresses as well as stability.

h. Prestressed Concrete Bridge Design Seminar

Date has been set for November 14, 2018, at the McKimmon Center. G/C PCI has been working with ACEC on the agenda, although they have not submitted any comments on the agenda. Lateral stability can be addressed at the seminar. Trey will poll his staff for any ideas for topics. Reid Castrodale was preparing for a seminar for PennDOT that basically follows the previous NCDOT seminar. A topic that was mentioned for the PennDOT seminar was the tendency of designers to over-design, which is not always a good idea, and can even create problems in some cases. More contractor involvement would be good.

4. New Business

a. Inspections, standard NCR and associated repair procedure

Peter Finsen brought up a discussion from Coastal Precast regarding stamping of girders. Cabell Garbee distributed a draft "Prestress Concrete Inspection for Authorization to Ship/Payment" [Copy Attached], which gave the Department's preference regarding stamping. The Department would like to use their time to monitor processes in the plant and not have to look at pieces more than once. When girders are approved for early payment, they have to go back and inspect them again prior to shipping. Cabell will distribute a final version after the draft has been reviewed and approved internally. If the contractor changes the schedule so some girders will be in storage longer than expected, the Department will work with the supplier regarding early payment.

Jeff White gave a general discussion about cash flow in a prestress plant, which is very important for the continued operation of a plant. He said that a simple plant costs about \$3M to get set up, without considering the materials for the girders. Then materials have to be purchased in advance of making the girders. This is why payment for stored materials is so important. Chris Arca had also discussed this with Cabell earlier. There are further delays in payment when the precaster submits to a subcontractor for payment and the money has to travel through more hands before it gets back to the supplier. Cabell directed the producers to talk to the inspector if payment is needed for large or multiple items; they can consider submitting girders for payment by pour rather than by span. JR Parimuha suggested that payment for girders should be by pour, like for piling, rather than waiting until a span is completed. He has a wide bridge with 15 girders in a span for which payment is being held up waiting for completion of the full span because of issues encountered with some of the girders. JR said that this would work for girders, but that cored slabs and box beams would still need to be paid by span. Cabell said they would consider the change for girders.

Reid Castrodale reported that producers are concerned that there is no longer any visual mark on products indicating they are accepted. Jason Poppe said that his inspectors were getting away from

stamps, but they were fine with plant QC adding a mark indicating acceptance. The resident or inspector at the jobsite have scanners so they can determine if the delivered product is approved. However, producers questioned whether scanning will indicate approval; when they scan product in the plant they cannot tell if it is approved or not. Cabell said that the field should be able to get the approval when they scan the product, unless the approval just went in that day, in which case it would not show up until the next day. There have also been some problems with the field understanding what they need to do to accept product, and there have been a limited number of scanners at a project, and sometimes they are elsewhere on the project when needed to accept girders. Cabell said that if producers ever hear from the field that there are problems with accepting products, please call him and they will get it straightened out.

Cabell Garbee noted that when shipping to a local agency project that requires NCDOT approval, the agency can access the products on the NCDOT website to determine if they are approved. However, approved products are labeled in the system as “available” rather than approved.

The second page of the draft procedure distributed by Cabell addressed procedures for a product non-conformance. Jason Poppe described the standard procedure for an NCR which is that the inspector and QC manager should be talking about the situation. The inspector will prepare the NCR and the precaster will submit a repair procedure. The two items are now to be sent as a single package to Structure Management Unit, where they had been submitted independently in the past. The process for addressing honeycombs was discussed as an example. Cabell indicated that this would be an item for which a standard repair procedure would be used if certain criteria are met. If the procedure is not accepted, comments should come back with the submittal for how the repair procedure can be improved. Jeff White gave an example of a girder that they refabricated because of the tight schedule rather than wait for resolution. Brian Hanks indicated that in special situations when time is very critical, such as a girder being held in the bed awaiting repair or the girder delivery schedule if very tight, the supplier should contact Cabell and Madonna after discussing with the inspector. In regular circumstances, a response to an NCR should be received within 10 days.

Standard repair procedures for common defects are being developed by Madonna and Sherry for procedures that are commonly approved. A procedure for spalls is nearly complete. The procedures will be based on the PCI Repair Manual and will be kept on file and will also be on the Sharepoint site, so they will be accessible by all NCDOT project staff. If the non-conformance is outside the standard procedures, more information will be required. The intent of the standard procedures is to allow rapid approval of the standard items.

b. NCDOT - AGC Bridge Subcommittee - G/C PCI forum on project delivery

Chris Peoples reported that Brian Hanks and he had attended an NCDOT/AGC joint forum where Kevin Burns, a contractor (R E Burns & Sons), raised the issue of getting prestressed concrete products in a timely manner. On one recent project he had a tight schedule and was told by his supplier that he could not get his box beams until a month after he needed them, which would not work with his schedule. The contractor ended up going with another supplier. This problem is expected to only get worse with all of the work that NCDOT is putting out now. There was a second contractor that mentioned a similar problem, but Chris was not sure who it was. The Department is very sensitive to project delivery, so they want to address this issue, recognizing that the volume of work is increasing. Brian Hanks gave the number of division projects that will be coming out in the next 3 fiscal years: 162, 130, and 120, most of which will be cored slab and box girder bridges. The AGC Bridge Committee meetings every two months, if there are topics to discuss, and Chris suggested that PCI come to the next meeting where this could be discussed, and figure out if there is a problem with other contractors. The meeting would also provide G/C PCI the opportunity to inform the contractors about current and potential capacity for producing bridge products. It would also provide an opportunity to let the contractors know how they need to let the industry know about projects and their deadlines. Communication and work flow is very important. If the Department can provide as much information about design/bid/build projects as possible, that is also helpful to the suppliers for planning.

Jeff White and Chris Arca also mentioned that design/build projects can make it difficult to plan. A plant gets a project, but it may be several years before they receive the plans and orders for the girders. Then all other projects have to take a back seat to that design/build project from that time on. Producers do not know when that work will be required, which makes it difficult to plan and bid other projects. Variability in designs also complicates work for the producers when, for example, on a 300 girder job, the supplier figures 100 cycles, but the strand patterns are such that it will take 180 cycles, which has a great impact on their delivery. Some contractors work with the suppliers well, and get them involved early, but others wait until the design is final before they come back and try to get a better price. Designers need to be educated so they realize that optimizing the strand pattern for every girder will not save them money. Brian Hanks said they are seeing similar things with designers changing the strand patterns even for the standard cored slab and box beam designs.

Chris Peoples said that the Department is very interested in working with the industry to improve project delivery, making it more efficient and faster. So PCI needs to make their voice heard so that the process can be improved. It won't ever be perfect, but it can be improved. Brian Hanks mentioned that NCDOT is planning to spend \$4B this year, with \$330M on the bridge program alone.

There was discussion about the AGC Bridge Contractors meeting on April 11. At least 3 contractors were expected to attend. It was not clear whether R E Burns would be present: Sanford, Dane & ST Wooten. G/C PCI expects to have good representation. Peter Finsen said that he would like to get Eastern Vault and Ross Prestress as well. Cabell Garbee said that he would talk to them.

Brian Hanks mentioned that they are working with the divisions on the express design/build projects that were bundling 8 to 10 projects in a single bid, but that was taking too much time. So they are looking to make the bundles smaller, with 3 or 4 projects in a bid, with similar girder types and located in the same area. JR Parimuha indicated that the express design/build projects seem to be holding closely to the NCDOT standards for box beams and cored slabs.

c. Bar marks within a project [Added]

The fabricators had seen some instances where a set of plans had used the same bar mark for a different bar. Jeff White gave an example where S1 bars in spans A and C were #4, while for span B, the S1 bars were #5. The correct bars were ordered, but in the plant, when span B girders were fabricated after span A girders had been completed, #4 bars were inadvertently used. The engineer that produced the drawings said that all the other states he has worked in would use a different mark for a bar with a different size. A similar problem can occur when the same bar mark has different lengths in different spans. NCDOT intends for each bar mark to be unique for the plans but using their standards and looking at each span separately could lead to these problems. Plan reviewers need to be aware of this – possibly a topic for the seminar. NCDOT will make plan review aware of this issue.

5. Project Update – James Bolden provided an update on the overall bridge program funding for the next five years but could not provide us with a copy of the list. Only two categories are listed here, along with the total. Categories not listed include bridge preservation, Federal aid, and high dollar/high value bridges.

	Divisions:	Central Ofc:	Total:
FY 2018:	\$154M, 199 bridges	\$414M, 30 bridges	\$399M, 289 bridges
FY 2019:	\$170M, 162 bridges	\$112M, 30 bridges	\$419M, 219 bridges
FY 2020:	\$147M, 129 bridges	\$206M, 48 bridges	\$589M, 226 bridges
FY 2021:	\$117M, 122 bridges	\$204M, 46 bridges	\$518M, 250 bridges
FY 2022:	\$83M, 88 bridges	\$42M, 7 bridges	\$316M, 130 bridges

While the funding levels listed are declining in the later years, the Department hopes that additional funding will be identified by that time which will allow for additional expenditures.

6. Action Items:

a. G/C PCI to provide comments on placement of RFID tags in products

b. Review minutes of previous meetings to determine the agreed locations for tags

It was agreed that tags should be placed in top flange, typically by floating them in, located about 5 ft from the end. The tags can be in the top surface or the side of the top flange, whatever works best for the plant. After the bridge is completed, the data will most likely be accessed using GPS coordinates rather than a master tag.

c. NCDOT to send FIB details to G/C PCI for review prior to posting

In process

d. NCDOT to consider welded wire reinforcement option for girders – in process

In process

e. NCDOT to consider modifying requirements for rubbing girders, possibly limiting to exterior faces only

In process

f. G/C PCI to identify issues or limits related to lateral stability, including the location of lifting loops

A good rule of thumb for locating the lifting loops would be 1.5 x the girder depth from each end. This was agreeable to the group.

g. Gichuru Muchane agreed to reach out to Maintenance and Construction regarding attending meetings

Cabell Garbee will identify contacts for NCDOT and will provide a list of contacts to Peter Finsen for future meetings.

h. Reid Castrodale to prepare minutes from meeting

Hopefully much sooner than for this meeting.

7. Technical Committee Meeting & Tasks July 12, 2018 at 1:30pm at NCDOT - SMU

Trey Carroll is the contact for the Technical Committee meeting. Agenda items will be identified. Send out minutes of last meeting with agenda for next meeting. Some topics discussed in the current meeting will be on the agenda, as well as topics for the PS Design Seminar.

8. Next Joint Meeting: Thursday, Nov. 15, 2018 @ 1:30pm

9. Next PCEF Meeting: Last Meeting: February 15, 2018 – 10am – 4pm (Atlanta, GA)

Next Meeting: Thursday, March 29, 2018 @ 1:30pm

Jason Poppe asked why Ross Prestress (Ricky Merritt) and Eastern Vault (Brian Strubel) do not attend these meetings, and if they would attend the AGC meeting in April. They are invited by G/C PCI to demonstrate value to them. NCDOT will contact them and encourage them to attend.

There was also some discussion of the plant in Columbia, SC. It is called the Smith/Columbia plant, and is associated with the Smith/Midland Company.

10. Adjournment - 4:10 pm

Prestress Concrete Inspection for Authorization to Ship/Payment

Girders and Beams

The Department's preference is that when a Producer finishes a span, the Materials and Tests inspector (either a NCDOT Employee or Contract Engineering Inspector) will then perform the final inspection¹ of all of the members in the span when the Producer indicates that work upon the items in the span has been completed.

Piles and Deck Slabs

The Department's preference is the Materials and Tests inspector (either a NCDOT Employee or Contract Engineering Inspector) will perform the final inspection¹ of all of the members in a cast when the Producer indicates that work upon the items in the cast has been completed.

All Items

Upon determination that the members are acceptable, the Inspector will complete the documentation required for shipment and payment of the members in the span.

"Final Inspection" is defined as the inspection wherein the Department's Inspector determines the suitability of any repairs that have been made, records fitment information, and approves the item for shipment.

We will perform final inspection for quantities less than full spans or casts in cases such as:

1. If you start on items for a contract and have to stop to produce items for another contract that has been moved ahead of the current contract by the Department.
2. If a Contractor has an urgent request to ship partial spans in order to facilitate an intermediate contract deadline or a change in the project's construction schedule.
3. Production rates for specialty items would create a hardship if not inspected on a piece by piece basis.

The Department will continue to perform checks during production of items including inspection of pieces after casting/removal from beds and will communicate any concerns to the Producer as they are noted.

Non Conformance

Please note that if a Non Conformance has occurred, it is important that the Producer's QC Department submit the proposed repair procedure as soon as possible so that the Materials and Tests Unit can submit it with the NCR to the NCDOT Structures Management Unit for approval in a timely manner.

For issues for which a standard repair method has been authorized, the Producer's QC Department will confirm with the Department's Inspector that the issue qualifies as a "Standard NCR" prior to performing the repair. The "Standard NCR" will be completed to document the issue and repair².

Notes:

- 1) Items will be reinspected prior to shipment if there is a sufficient time lag (several months) between approval of the pieces at the yard and the actual shipment date to warrant concern for changes in fitment dimensions such as camber or sweep or if storage/handling damage is suspected.
- 2) Standard NCR are defined by the Structures Management Unit. Standard NCR are to be submitted to Structures for documentation of the incident and are to be filled in the Materials and Tests inspection files (using Sharepoint) for the structure/contract).