ASCE – INDOT
STRUCTURAL COMMITTEE
MEETING NO. 87 AGENDA

March 26th, 2020
9:00 am, Webex

Meeting called to order at 9:00 am by Mike McCool. Those in attendance were:

Brandon Arnold -	USI Consultants, Inc.
Ben Borcherding -	American Structurepoint, Inc.
Mike Eichenauer -	BF&S, Inc.
Mahmoud Hailat -	INDOT
Jennifer Hart -	INDOT
Derrick Hauser -	INDOT
Jeremy Hunter -	INDOT
Mike McCool -	BLN, Inc.
Derek Merida -	Milestone Contractors, L.P.
Jose Ortiz -	FHWA
Sean Porter -	Parsons, Inc.
Anne Rearick -	INDOT
Jim Reilman -	INDOT
Katlyn Shergalis -	Lochmueller Group, Inc.
Mark Swiderski -	INDOT
Stephanie Wagner -	INDOT
Mike Wenning -	GAI Consultants, Inc.
Peter White -	INDOT

In addition to the attendees, these minutes will be sent to the following members:

Michael Black -	INDOT
Lisa Haas -	Prestress Services, Inc.
Mike Nelson -	INDOT
Kurt Pelz -	INDOT
Elizabeth Phillips -	INDOT
Seth Schickel -	HNTB

1. **INDOT update on remote operations** – All INDOT employees are currently working remotely. Microsoft TEAMS used internally. For field checks, suggest using video conferencing and street view imagery. Consultants to coordinate with INDOT PMs to arrange means of communication.
2. **Review and approve Meeting 86 minutes**
    a. Approved
3. **Bridge Design Conference Review (<u>McCool</u>)**
    a. Good turnout, just under 200. Some good survey comments. Overall, it was a success.

b. M. McCool will compile summary of survey responses for next in-person meeting.

4. **Research Needs and Innovative Ideas Update (Rearick)**
    a. A. Rearick presented topics that have been short listed. They are included at the end of these minutes.
    b. M. McCool offered to help with pedestrian bridge inspections topic.
    c. Once need statements are developed, they are presented to INDOT Executive Board for approval.
    d. P. White suggested list be sent to members of committee for review and feedback after need statements are created.
5. **Concrete mix designs**
    a. P. White offered to help in Mike Nelson's absence.
    b. M. Wenning mentioned mixes such as lightweight, semi-lightweight, self-consolidating, and internally cured concretes. Suggested we revisit to finish mix designs and provide more guidance to design community. P. White agreed.
    c. Subcommittee created: P. White, M. Wenning, M. Nelson, M. McCool, & Derek Merida
6. **Pile Design for 3-sided structures (White, Schickel, Borcherding, Hunter)**
    a. No update
7. **Semi-integral bent details (Wagner, McCool, White, Schickel, Borcherding)**
    a. No update.
    b. Derek Merida added to subcommittee.
    c. May break this item into subsets.
8. **LRFD vs LFD on Rehabilitation Projects (Hunter, McCool, Eichenauer, Wenning, Arnold)**
    a. J. Hunter developing survey to send to design community. Will be distributed via the INDOT listserv.
    b. Indiana is one of few, if not the only, states pursuing this topic.

c. M. McCool asked that each of us request each member of our respective design teams respond to survey, not just one from each group.

9. Sand Bag Cofferdams (Hunter, Phillips)

a. J. Hunter spoke with Sandy Bowman (INDOT Ecology & Waterway Permitting). She is open to proposed language on cofferdams in permit applications to simplify process.

b. J. Hunter asked for opinions on proposed language. Wants to give language that allows for construction of cofferdam and dewatering but also allows flexibility in means & methods.

c. M. McCool asked that Jeremy distribute a USP to group for review. J. Hunter asked committee for example USPs and/or plan details we've used. He would also appreciate contractor feedback.

d. ***Action Item*** - Committee members to submit examples to Jeremy within next two weeks.

10. **Elastomeric Bearing Pads (Wenning, White, Porter) (Done????)**

a. P. White contacted bearing assembly fabricators & testers. He suggested we first focus on getting all pads vulcanized to top load plates, if there are load plates in the design. Standard Drawings and Specifications should be revised accordingly.

b. Topic should be removed from the future agenda.

11. MSE Wall Shop Drawing Revision Checklist (White, Hunter)

a. P. White stated it will be split into two steps. First is a shop drawing review checklist. Second is design review checklist, which would be performed during design and plan development.

b. A revised version will be created based on industry feedback and will be sent to Structures Committee members again for review.

c. Jeremy Hunter added to subcommittee.

12. WWR in prestressed beams (Hailat, McCool, White)

a. M. Mahmoud just started his design of a single span INDOT bridge. LEAP Bridge Concrete has added WWR to possible bars for shear design in Precast/Prestressed Girder module. Example designation, “D20”.

b. INDOT is working on independent checks to verify horizontal shear design.

c. M. McCool asked if we could insert the typical “U” bars in the top flanges for the horizontal shear and not have the WWR stick up out of the beams. P. White stated goal of investigating WWR in beams was to eliminate as much conventional rebar as possible. He suggested instead inserting “hairpin” rebars that extend from web to deck, which could be designed at greater spacing than the WWR. To design the hairpin bars, a separate run in LEAP may be required, or a separate hand computation to satisfy requirements using “Intentionally roughened” analysis.

d. P. White also commented that Specifications section 737 already permits contractors to request use of WWR in lieu of conventional rebar in beam design.

e. Ultimately, a Design Memo will be developed to provide direction on the topic.

f. S. Wagner added to subcommittee.

13. **TS-1 Railing (White)**

a. P. White stated that as long as we are not changing the system so that the hex bolt is no longer the weak link in the connection, we have not compromised the integrity of the railing system.

b. It should only be used on LPA projects. Suggested minimum coping dimension of 10”.

c. P. White stated that an alternative side-mounted railing that has been MASH crash tested is available. INDOT is working on finalizing details and accompanying specs.

d. Move topic to “Parking Lot” until alternative side-mounted railing details have been fully developed.

14. **Expansion Joint Material (White, McCool, Porter, Schickel)**

    a. P. White states that “EPS’ is meant to be expanded polystyrene, not extruded polystyrene. Expanded polystyrene is more compressible. P. White asked for feedback if we should specify product in more detail, or if current practice is acceptable.

    b. Subcommittee to review each location where this material is used in a bridge, and then determine where compressible characteristics are truly needed.

    c. D. Merida will contact suppliers for pricing.

    d. M. Wenning to be added to subcommittee.

15. Self-Consolidating Concrete for Box Beams (White)

    a. P. White will be leader of subcommittee.

    b. Mike Nelson is currently working on this. Basing work on usage by others states.

16. **Link Slab Design and Details (Spahr, McCool, Wenning, Schickel)**

    a. S. Wagner replaces Ed Spahr.

    b. Current research project on link slabs ongoing. Study to investigate different materials, lengths where specific design checks do not need to be made, etc.

17. **Parking Lot Discussion**

    a. Topics accepted.

    b. Anyone that wants to be on planning committee for next Design Conference, send email to M. McCool.

18. New Business

    a. Embedded Galvanic Anodes (White)

        i. P. White requested feedback on current design aid and guidance.

        ii. Product is good method to prevent continued corrosion of reinforcement around perimeter of patch or along joint line between new and old concrete.

        iii. Default spacing of anodes could be 24”, but should be verified by design based on density of reinforcement, chlorides, etc.

iv. Anodes should be tied to existing reinforcement extending out of existing concrete along joint. J. Hunter commented that better approach may be to core into existing concrete along edge of joint and attach anodes to existing reinforcement in holes.

v. M. Wenning added to subcommittee.

b. PVC Deck Drains on RC Slab Bridges (Wagner)

i. S. Wagner asked for feedback on root cause of issue and use of deck drains on such bridges.

ii. M. Wenning commented that many RC slab bridges are built on very flat grades, drains were perceived as good idea to avoid ponding. PVC will shrink in winter, creating gap around pipe for water and salts to enter concrete. New collar detail should be used to address this issue.

iii. M. Swiderski asked if using smooth wall vs corrugated PVC pipe is the issue. M. McCool responded stating his opinion is that cause is the shrinkage of Class "C" concrete. He stated other states only core hole in concrete, and don't use the PVC at all.

iv. M. McCool asked if we could change shoulder cross slope to 4%. M. Wenning said we could consider it.

v. S. Wagner suggested we could require a minimum longitudinal profile or grade to encourage drainage to run off bridge. Could use minimum grade break without vertical curve criteria.

vi. S. Porter, M. Swiderski, & K. Shergalis added to subcommittee.

c. Tying reinforcement together along joint lines in phased deck construction sequence considering dead load deflection, particularly on longer span bridges (Hunter).

i. M. McCool (lead), P. White, B. Borcherding, & Derek Merida added to subcommittee. S. Porter suggested J. Reilman should be added as well.

d. NEXT Beams (Hunter).

i. J. Hunter stated that prestressed fabricator is willing to fabricate them, but wants design community to select a singular type of modular system.

ii. Prefabricated modular units should be a new subcommittee, per Jeremy.
iii. M. McCool suggested NEXT beams should still be separate from steel beam options.
    1. M. McCool will lead NEXT beams. P. White will join NEXT subcommittee.
iv. B. Arnold will join steel option, J. Hunter as well. M. Mahmoud will join overall ABC option & steel.
v. P. White stated we need a large number of projects to make using NEXT beams worthwhile. M. McCool suggested we target adjacent box beams scheduled for superstructure replacement as possible projects.

Recurring Business

Bridge Practice Pointers Update (Hunter, Wagner)
Standards Committee Updates (Phillips)
Overlay Types (Hunter, White)

Research Projects

Fire Damage on Concrete Bridges
Seismic Assessment Design and Retrofit
ABC Guide
Strut-and-Tie Modeling

Parking Lot

Long term deflections in prestressed beams
Special provision for high strength concrete
Mild reinforcement in prestressed beams (particularly 401 bars)
Post Tensioning Specs
Terminal Joint Details
Alternate Structure Types
Continuity of Prestress Concrete Beams (Heidenreich)**(TRB Research)**
NEXT Beams (McCool)**(still looking for applications)**
Hydro-demolition (Wagner)
Fiber Wrap (Jessop)
High Early Strength Concrete (Nelson)
Expansion Joints Options (Wagner, White, Eichenauer) **(PP)**
Load Rating Policy and Procedures (Hunter)
Approach Slabs (Hailat,)

Bridge Deck Overhang Design (Wagner, McCool, Hunter, Eichenauer)

Pile Driving Recommendations

SIP Forms (Hunter)

Girder Stability (McCool, Arnold, Porter, Eichenauer, White)

Short-Listed Research Topics

1) Predictive Analytics for Quantifying the Long-Term Cost of Defects during Bridge Construction
2) Exploring trade-off between amount of inspection time vs quality of delivered product
3) Determination of Economic Effects; Life Cycle Cost Implications
4) Shear and Bearing Capacity of Corroded Steel Beam Bridges and Effects on Load Rating
5) Implementation of NDT Bridge Testing Results
6) Pedestrian Bridges – Development of New Criteria for Design & Construction
7) UHPC Implementation and Usage in Indiana – Developing Cost Effective Use Cases
8) Addition of Polypropylene Fibers to Reinforced Concrete Bridge Deck to Mitigate Cracking
9) Long-term Durability of Fire Damaged and Repaired Bridges in Indiana
10) Improved Link Slab Connections for Jointless Bridge Decks
11) Development of Truck for Bridge Load Rating – Changeable Axle Spacing and Axle Load
12) Pedestrian Bridges – Development of Formalized Program for Inspection
13) Construction Zone Dashboard Using Probe Data & CANBUS Output.
14) Speed Management through Traffic Control Devices
15) Workzone Speed, Congestion, Queue, Crach, and Geometry analytics to support INDOT's 2020 Construction Workzone Activies
16) Variable Speed Limits