

**ASCE – INDOT
STRUCTURAL COMMITTEE
MEETING NO. 94 AGENDA**

**December 9th, 2021
9:30 am, MS Teams and BLN Office**

1. Review and approve Meeting 93 minutes.

- a. Approved

2. Bridge Design Conference – Update (Lesh)

- a. Planning going well. Auditorium technical testing ongoing.
- b. Content – ongoing. M. McCool will lead presentation on RC Slab coping replacement / epoxy anchors.

3. Concrete mix designs (White, Nelson, Wenning, McCool, Merida)

- a. Task group has been meeting once per month.
- b. Topic is naturally getting combined with pour sequence topic.
- c. Lightweight concrete
 - i. A historic truss rehab over Wabash River project may become test project for a lightweight mix design.
 - ii. At this time, lightweight concrete will not be pursued as a standard for deck design. However, it will be investigated for beam design.
 - iii. Lightweight beams are more difficult to cast. Takes longer before forms can be stripped. Beam fabricator does not prefer that this becomes routine. Suggests only considering for longer spans, say at least 120 ft.
 - iv. Max $f'c$ for lightweight should be 8 ksi, not 10 ksi.
 - v. Contact M. Nelson to get current specifications if it will be used; not part of Standard Specifications.
 - vi. S. Wagner wants criteria and considerations for use fully determined before mentioning at Bridge Design Conference.

4. Pile Design for 3-sided structures (White, Schickel, Borcharding, Hunter, Merida)

- a. Pass

5. Semi-integral bent details (Wagner, McCool, White, Schickel, Borcharding, Merida)

- a. Task group is collecting previous plans & is looking for larger skews (≥ 30 deg), plate girders, longer spans, and a bulb-tee.
- b. Send example sets to S. Wagner. Before sending, strip out all non-detail sheets.

6. LRFD vs LFD on Rehabilitation Projects (Hunter, McCool, Eichenauer, Wenning, Arnold)

- a. Eichenauer (Substructure) – Analysis ongoing. Example used originally designed in ASD, has been upgraded to LFD, and then tested in LRFD. 1% reinforcement was not requirement in ASD so theoretically failed in LFD. Overburden on foundations also became issue for getting bearing pressures to check out.
- b. Wenning (Prestressed Beams) – Nothing since last time
- c. Arnold (Deck) – Same. Will pick back up next month. Bigger issue is change in loading from one code to the next, not the change in design checks.
- d. McCool (Steel Beams) – Progress being made on analyzing steel girder bridge. Going through comparison of checks.

7. Sand Bag Cofferdams (Hunter, Merida, Hailat, Porter)

- a. J. Hunter – Engineered scour countermeasures might be beneficial in locations where we might need cofferdams for rehab projects. Should be an environmentally clean solution. Might not need to be keyed into channel. Might be able to be staked. Need stable base material underneath. Currently considering on spill slopes with low vertical clearance.
- b. On new construction, still need traditional cofferdams. We could change approach and pay contractor for sheet pile, leave it, and then possibly not need riprap. Leaving in place avoids risk of adding lateral surcharge loads onto pier foundations during sheet piling removal operations. D. Merida – putting new

sheeting in for each cofferdam would be very expensive as sheets currently get re-used.

8. PVC Deck Drains on RC Slab Bridges (Shergalis, Wagner, Schickel, Porter, Swiderski, Cowan)

- a. K. Shergalis – Group wants to contact the Midwest DOT task group first before finalizing guidance.
- b. M. McCool – LaPorte District wants to eliminate existing drains and plug them. If kept, they want them extended.
- c. K. Shergalis – Greenfield District is similar, wants to eliminate them.
- d. S Wagner – Will address this at next INDOT Bridge Asset Engineer meeting.
Will try to get consistent among districts.

9. Staged Deck Pours and Reinf. Details (McCool, White, Merida, Borcharding, Reilman)

- a. M. McCool – Group is looking to standardize pour rate spreadsheet. Guidelines being developed.
- b. Goal is to develop a Bridge Design Aid for design to get closer to how contractors want to pour.
- c. Re-investigating concept of pouring pier diaphragms to bottom of deck first and then come back and pour deck continuously across the bridge.

10. NEXT Beams (McCool, Hunter, White, Wenning, Arnold, Wagner)

- a. Task group met earlier this week. Researched other State DOT's design manual guidance & standard drawings.
- b. Group is creating a Pros/Cons, both general for NEXT Beams and then by type.
- c. INDOT currently has three projects in development that will use NEXT Beams.
Two are type D, one is an E, none are an F. Lessons learned from these projects will be used to help develop guidance for design community.
- d. Hope to present at 2023 Bridge Design Conference

11. **Steel / ABC** (Arnold, Hailat, McCool, White, Eichenauer, Cowan)

- a. Met with INDOT Central Office in November to discuss details for US 33 project.
- b. Meeting for Item #14 now scheduled. Concepts from US 33 meeting will be included.

12. **Bearing Pad Standards** (Swiderski, White, Wenning, McCool, Schickel, Merida)

- a. Pass

13. **STM for End Bents** (Arnold, Hailat, Hunter, Schickel, White)

- a. P. White to continue to work with Purdue to get spreadsheet developed for end bent design with STM. Will report back at next meeting.

14. **ABC Worksheet** (Schickel, Hunter, McCool, Arnold, White, Cowan)

- a. S. Schickel – Group will meet in January. Goal is to develop guidance, decision matrix, etc. to decide if ABC makes sense and then what type of ABC is best.
- b. On US 52 project, feedback so far is that it was harder to design, contractor wanted more time to construct, and contractor wanted more inspection of precast units before they are sent to job site.
- c. M. McCool – We should create a list of the construction techniques that are considered to be accelerated in Indiana. This could be not only precast elements, but could be cast-in-place with high early strength concrete, etc.
- d. S. Wagner – Determining if ABC is to be used should be done at the Scoping stage. Then, guidance developed from this group on which ABC type could be used by designers.

15. **Standard Prestressed Concrete Beam Detail Sheets** (Lesh, Wenning, Hart, Wagner, Cowan)

- a. J. Lesh – Still working through welded wire reinforcement and how we want to detail in beams as a standard if chosen in lieu of conventional reinforcement.
- b. Working on updating the previous sample set (beam details)

16. Sample Plans Steel Bridges (Wagner, McCool, Lesh, Schickel, Cowan)

- a. S. Wagner – Group now has a set with a partial superstructure replacement (steel beams). Also working on developing requirements for steel plate girder details sheets. Currently adding red notes to sample set and reviewing those.

17. Prestressed Beam Lifting loop locations (Wenning, Reilman, Shergalis, Hailat, White)

- a. M. Wenning – P. White has made progress. Will present at next meeting.
- b. M. McCool – guidance needs to also get incorporated in standard prestressed beam details.
- c. M. Wenning - Criteria for responsibility of location & design will be covered by Standard Specifications.

18. Epoxy Anchors (Arnold, Hailat, White, Shaw)

- a. B. Arnold - Task group met in November. Multiple opportunities for improvement noted in both IDM & INDOT Standard Specifications.
- b. Arnold assigned to research example calculations following ACI code, which is required to be followed per the LRFD code. This work has begun.
- c. Will be part of presentation during 2022 Bridge Design Conference, but no formal change in policy yet.

19. RC Slab Edge Beam Replacement Details (McCool, White, Shergalis, Arnold, Hailat, Eichenauer)

- a. M. McCool – Requests from contractors to sawcut all the way through and not clean and straighten bars is common. However, this needs to be carefully considered by designer before approving.
 - i. Example, three-span slab bridge might use the top transverse deck bars as part of the pile cap design. Custom removal limits could be used in this case.

20. New Business

- a. S. Wagner – Currently INDOT research season – requested topics from group.
- b. S. Wagner – requests that Donald Shaw (DJ) be added to this committee.

i. Approved

c. Next meeting on March 10, 2022 at 9:30 am (est)

Recurring Business

- Bridge Practice Pointers Update (Hunter, Wagner)
- Standards Committee Updates (Phillips)
- Overlay Types (Hunter, White)
- Link Slab Design and Details (Wagner, Wenning, Schickel)
- Research Needs and Innovative Ideas Update (Wagner)

Bridge Design Conference Topics

- US 52 over Mud Creek (ABC) project presentation (HNTB)
- Current Research Projects Overview (M.Wenning)
- RC Slab Edge Beam

Concrete Mix Designs

- E5 / internally cured concrete
- semi-lightweight
- lightweight
- rapid curing concrete in RCBA (currently a RSP)
- UHPC (nonproprietary)

Research Projects

- Fire Damage on Concrete Bridges
- Seismic Assessment Design and Retrofit
- ABC Guide
- Strut-and-Tie Modeling
 - Pack Rust - Mitigation Strategy Effectiveness
 - Repair and Strengthening of Bridge using FRP
 - A New Approach to Accelerated Fabrication of Steel Bridges: Design, Optimization, and Demonstration
 - Evaluating Reserve Strength of Girder Bridges due to Bridge Rail Load Shedding
 - Pedestrian Bridges -- Development of New Criteria for Design & Construction
 - Seismic Evaluation of Indiana Bridge Network and Current Bridge Database for Asset Management
 - Self-Healing Concrete
 - BIM for Bridge and Structures
 - Development of Protocols for Reuse Assessment of Existing Foundations in Bridge Rehabilitation and Replacement Projects
 - Pile Stability Analysis in Soft Soils
 - Legal and Permit Loads Evaluation for Indiana Bridges
 - Use of LRFR Methodology for Load Rating of INDOT Steel Bridges

- Improved Live Load Lateral Distribution Factors for use in Load Rating of Older Continuous and T-Beam Reinforced Concrete Bridges
- Shear and Bearing Capacity of Corroded Steel Beam Bridges and Effects on Load Rating
- Civil Infrastructure Systems Open Knowledge Network (CIS-OKN)
- Implementation Study: Continuous, Wireless Data Collection and Monitoring of the Sagamore Parkway Bridge

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**)
- 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)
- TS-1 Railing (White, McCool)
- Clear Deck Forms (Schickel)