

# ACEC/MaineDOT Bridge Design Subcommittee

## MEETING AGENDA

June 25, 2024

### Location

Hybrid: Virtual/MDOT HQ Room 227

### Time

1:00 PM to 3:00 PM

### Purpose of Meeting

2<sup>nd</sup> Quarter Meeting - 2024

### Invitees

- |  |  |
|--|--|
| ▪ Garrett Gustafson, MaineDOT                    | ▪ Wayne Frankhauser, MaineDOT              |
| ▪ Laura Krusinski, MaineDOT                      | ▪ Ben Toothaker, TYLIN                     |
| ▪ Ron Taylor, MaineDOT                           | ▪ Shannon Beaumont, Fuss & O'Neill         |
| <input type="checkbox"/> Richard Myers, MaineDOT | ▪ Bryson Welch, Thornton Tomasetti         |
| ▪ Devan Eaton, MaineDOT                          | ▪ Bryan Steinert, Haley & Aldrich          |
| ▪ Joshua Hasbrouck, MaineDOT                     | <input type="checkbox"/> Robert Blunt, VHB |
| <input type="checkbox"/> Tim Aguilar MaineDOT    | ▪ Carl Ayers, VHB                          |
| <input type="checkbox"/> Chad Lewis, MaineDOT    |  |

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## AGENDA ITEMS

- Members
  - Bryan's first meeting
  - Start of VHB's term Carl Ayers is sitting in for Bob Blunt
  
- Meeting Minutes Submission
  - Meeting minutes for Q1 were reviewed and have been posted to the ACEC website
    - *ACEC to resolve issue with the link for prior meeting minutes.*
  
- Information Dissemination by MaineDOT
  - Contracting/workload:
    - *No change from last meeting, Projects starting up now*
    - *Next workplan expected to be similar to the recently approved workplan.*
    - *Looking at supplemental funding needs, high priority item, this comes off the top of the years funding package.*
    - *Strong emphasis to wrap up PDRs and get sound estimates to help planning for next workplan cycle.*
    - *PE only doesn't typically get additional funding until closer to PDR*

- **BDG update:**
  - *Comments on the drafts for first three chapters have been largely resolved. A wider distribution to consultants anticipated later this summer, likely ahead of next ACEC meeting.*
- **GCA Schedule:**
  - *Laura indicated that the department wide RFQ process starts this fall.*
  - *Construction GCA is on a different cycle*
- **Federal Grants & Federal Funding Updates:**
  - *Two large projects*
    - *Overpasses Sydney to Trafton road in Waterville*
    - *1395 bridges*
    - *Both are expected to be in the 60-80M range*
    - *Waiting on word for additional grants in process.*
    - *Recent grant for Low-carbon construction materials (not sure if the department will chase)*
      - a. *Sample is high-efficiency concrete or warm mix asphalt*
      - b. *EPDs – show that project has a reduced carbon footprint.*
        - Not sure if maintenance is ready for that.*
          - i. *Challenging to determine how EPDs are calculated.*
          - ii. *DOT projects often already consider this, but quantifying to get credit is challenging*
    - *More grants coming through ENV for habitat connectivity/fish passage, etc.*
- **MaineDOT Staffing Update:**
  - *No significant changes. DOT has had a continuous posting for ATEs for awhile now, with limited interest.*
  - *DOT has not been able to hire any technicians*
- **Standards Update (BDG, PDR/PIC, CADD, Notes) –**
  - *No significant updates*
  - *Working on updates to PDR templates. Might be awhile before they are pushed out. Most consultants have seen comments about the sections that are being changed.*

- OpenRoads update –
  - *2023 configuration is available and pushed out to the website.*
  - *Only 2023 configuration is used at this point. All older files should be converted to 2023. If they aren't converted when sent to DOT, they will be upon opening here.*

- Summary of Designer Meetings

- *Two meetings, minutes distributed to consultants*
- *Note survey monuments when doing site walks. Need to loop in MaineDOT survey to relocate after completion*
- *DADs: If you have a project where a DAD may be a good fit, contact your PM. Ask the question, but don't count on it being approved. MaineDOT has some test projects in mind, but it's a slow process to get FHWA approval.*
- *New service life guidance is available from AASHTO, mostly focusing on concrete. Service life design may be used on some high-priority projects or researched for general guidance in the BDG but will not be used on most projects. Jonesport-Beals is one of the projects that has already incorporated some of these techniques.*

- Geotechnical Update (Laura K.)

*No updates*

- Discussion Topics

- Possible Hydraulics NHI course:
  - FHWA-NHI-135046: Stream Stability and Scour at Highway Bridges
    - Focus on HEC-18, HEC-20, HEC-23
    - Preventative techniques for Identifying, analyzing, and calculating various hydraulic factors impacting bridge stability
    - 3-day course
    - *DOT is looking for more design-focus*

- FHWA-NHI-135090: Hydraulic Design of Safe Bridges
  - Focus on hydraulic analysis and design
  - 4-day course
    - a. *If any consultants have contact info for instructor, that would be helpful. DOT is trying to gain insight into what the course covers, as the information published in the NHI course description is vague.*
- Multiple suitable courses, depending on preferred course focus. Some helpful relevant course topics based on recent projects include:
  - Determining hydraulic constraints (where to measure channel widths, upstream depths, etc.)
    - a. *Manuals do not give much detail on the where/how for the given information. (more focused toward scour side of design).*
  - NCHRP method
    - a. *More simple approach, used by MassDOT. But is a bit more subjective. Looks at local scour and contraction scour.*
    - b. *MassDOT bridge manual has changed recently (this month)*
- Hydraulics Design Requirement Clarifications
  - MassDOT very specific – (design requirement/standard pile cap below thalweg, shallow need to be below thalweg & abutment scour)
  - *Has been recent discussion on extending scour protection further based on December flooding. Considering changing size on riprap.*
    - *Heavy riprap detail in front of abutments? Possible*
    - *Leaning towards more use of heavy riprap along backslopes of abutments as that was a large portion of the failures during recent flooding, but noting that it was flood of record.*

- Draft PDR review times
  - PM provide updated schedule info on set timeline (quarterly?, bi-monthly?)
    - *Consultants should be in regular contact with DOT PMs. Regular communication between Consultant PMs and DOT PMs should preclude the need for new processes and procedures.*
  - Potential to break reviews into smaller chunks with informal submittals before a complete draft. Possible design checkpoints/soft submittals/coach points ahead of draft submittal
    - Proposed MOT
      - a. *Informal discussion as a minimum early in the process is necessary*
      - b. *Start earlier so that PM can begin outreach.*
    - Project Trending rehab vs replacement
    - Likely replacement structure types
    - Hydraulic approach/prelim design results
    - PDR Outline soft submittal that calls out likely MOT/MOT investigate, Hydraulic constraints/design, structure types, etc. with brief descriptions anticipated approach
      - a. *Good potential here?*
      - b. *No substitute for good communication with DOT PM.*
  - Potential for online shared reviews (VTrans) via studio sessions or similar
    - *Comment responses in PDF ok for Josh, Bluebeam comments will show up for folks using Adobe, but moving things can cause a few issues.*
    - *The group discussed various options for shared reviews within Bluebeam Software and Adobe Software, based on the experiences of the consultant chairs and MaineDOT chairs. Wider change and adoption within the DOT and wider consultant community faces challenges.*

- Ways to improve productivity/improving efficiency.
  - *Outline of construction schedule and key dates that can't slip (in-water work window, other constraint, etc.). Helpful for DOT PMs if they have an outline with some key dates which may push construction out an extra season if it is missed. Helps them prioritize workload, etc.*
  
- Additional Topics Raised in Meeting
  - *Load ratings – RPV parametric study. Hasn't been accepted by FHWA yet.*
    - *Legal configuration axle load variances. Ben to send information on observed variance in legal load configurations to Ron Taylor.*
  - *Potential for additional live documents which could be shared with consultants to help with program prioritization.*
    - *Nothing implemented. PM Preference for communication, etc.*
    - *Live documents have been beneficial for Thornton Tomasetti during reviews etc.*
  
  - *DOT noted that file exchange could be improved. Open to ideas from consultants on ways to improve.*
  - *From Wayne at the conclusion of the meeting: Rich wanted to give a heads up that they are putting out a bundle of a projects. Consultant would be responsible for full package with limited involvement from DOT. "Consultant Embedment" similar. Looking to put it together in the next few months. Sizeable bundle and would be an RFP. (12ish projects, and would include survey, ROW, Geotech, Not ENV but likely everything else). Multi-year term for PDR through final and construction complete. Likely a culvert-heavy bundle.*

- Suggestions for Future Discussion Topics
  - *Revisit goals of the subcommittee*
  - *Consider a new format*
- Training Needs:
  - *None identified beyond the NHI Hydraulic Course discussed in the meeting*
  
- Subcommittee Rotation for Consultants
  - Active:

• Ben Toothaker, TYLIN	Q4 2022 thru Q3 2024
• Shannon Beaumont, Fuss & O'Neill	Q2 2023 thru Q1 2025
• Bryson Welch, Thornton Tomasetti	Q1 2024 thru Q4 2025
• Robert Blunt, VHB	Q2 2024 thru Q1 2026
• Bryan Steinert, H&A	Q2 2024 thru Q1 2026
  - Future:

• John Byatt, BETA Group	Q4 2024 thru Q3 2026
• Adam Stockin, WSP	Q2 2025 thru Q1 2027
• Sarah Williams, Stantec	Q1 2026 thru Q4 2027
- The Next Meeting is set for:
  - *Tuesday, August 27, 2024 from 1-3*

*Meeting Minutes recorded by B. Toothaker, TYLin*

*Meeting Minutes/Discussion Recorded in Blue Italics*

Meeting Agenda items Recorded in Plain Black Text

# DESIGNERS MEETING

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Minutes for April 3, 2024

1:00 PM – 2:00 PM

Erin Brewer, Secretary

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## Topic 1: HEC-RAS Slope Sensitivity Analysis

- We can use the Steady Flow Data page in HEC-RAS to view a longitudinal profile at the same flow rate but with different downstream slopes to check that the slopes converge before the headwater elevation
  1. Open **Steady Flow Data**
  2. Write the number of slopes you want to try in **Enter/Edit Number of Profiles**
  3. Input the same flow rate under each of the profiles
  4. Go to **Options > Edit Profile Names** to change profile names
  5. Choose the **Reach Boundary Condition** Button then the **Set boundary for one profile at a time**
  6. Update the downstream normal depth slope for each profile
- We can use multiple Plans with different Steady Flow Data to check the same Geometry
- See Erin if you have questions

## Topic 2: Precast Slab Strand Pattern & Concrete Cover

- There was a conflict with the cover specified in a design note in the plan set and in the Standard Details that were used for design with [Wells, Buffam](#), which changed the center of strand location slightly
  - Standard Detail shows 1.5” concrete cover on bottom for void slab with 2.25” to the center of the bottom strand
  - Typical plan set note will say 2” of concrete cover
- Fabrication
  - We want to make it so they can reuse formwork and is easy to reuse formwork
- PCI Northeast has an updated [solid slab detail](#) (Jan 2024) that has a distance of 2.5” to the center of the bottom strand, which is different from our void slab Standard Detail
- For the future
  - Make sure that notes on the plan set match your design
  - Check in with PCI NE and other states to help standardize cover and location of the strands
  - Specify distance to strand and/or concrete cover on plans if not using Standard Detail
    - Concrete covers have ranged from 1.2”-2” in the past

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*End of minutes*



# DESIGNERS MEETING

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Minutes for May 15, 2024

1:00 PM – 2:00 PM

Erin Brewer, Secretary

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## TOPICS

- **Topic 1: Driveway Assistance Devices (DADs)**
- **Topic 2: Survey Monuments**
- **Topic 3: Service Life**
- **Topic 4: Estimating Asphalt Quantities**
- **Topic 5: AASHTO UHPC Publication**

### Topic 1: Driveway Assistance Devices (DADs)

#### What they are

- A signal in a driveway to be used in a temporary condition during construction
- Linked to through movement temporary traffic signals
- Can use up to 14 DADs between 2 traffic signals
  - DADs need to have a line of site to the traffic signals
- DADs are not designed for side roads
- \$800-\$2000 estimated per DAD (from one supplier)
  - 20%-\$40% of the cost of a signal per approach for DADs

#### Reason we don't use it yet

- Not legal in Maine and not federally legal
- Legally, signalized intersection has 2 heads (DADs have 1 head)
- We are working on a letter to fix this technicality
  - Brooke Glidden & Steve Laundry are working on it
- Implementation of DADs are not standardized within the state or between states which includes:
  - Signs are not standardized
  - Lights are not standardized
- Can't be used with flaggers

#### Once DADs are legalized

- 643 Special Provision and notes will be needed for PS&E

### Topic 2: Survey Monuments

- If there are survey monuments at a bridge either:
  - Add a general construction note
  - Or add it in the repair spec somewhere

- The concern is moving the monument during construction and survey not being aware of it

### **Topic 3: Service Life**

- Most bridges fail due to deterioration, should last min 75 years (AASHTO)
- Detailing is very important particularly on bridge drains and joints
- We decide to metallize or galvanize instead of doing special analysis
- Service Life Guidance will be in AASHTO folder
  - Mostly reinforced concrete detail
  - Cover vs type of rebar vs exposure analysis
  - Possible parametric study on concrete cover can be added to the BDG
- 4 types of Service Life Design
  - Probability based on site conditions (complex)
  - Partial factor – code spec method similar to LRFD
    - Will be widely available in 10 years
  - Deem to satisfy
    - Ex: 2 inches of cover
  - Avoidance of deterioration
    - Get rid of joints

### **Topic 4: Estimating Asphalt Quantities**

- Unit weight of 110lb/SY/in is the standard
- Be aware that 140 lb/ft<sup>3</sup> is what is in AASHTO for the weight of asphalt material
- We assume all asphalt has the same unit weight even if they are different mixes

### **Topic 5: AASHTO UHPC Publication**

- Guide Specifications for Structural Design with UHPC, 1<sup>st</sup> edition published in 2024
  - Covers design of girders and connections
  - UHPC is an excellent material for longitudinal closure pour such as in NEXT beams or full depth panels
    - Fairfield & Bath
    - Can make closure pours smaller
  - Could this get rid of transverse post-tensioning?
  - Struggling with material specifications since UHPC is tested using tensile strength
    - Testing for tensile strength for UHPC is challenging
    - Variability in test is large
    - Can be a liability for the fabricator since they are supposed to be consistent
- PCI wants to create a UHPC beam document using this AASHTO document as guidance

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*End of agenda*