

ACEC/MaineDOT Bridge Design Subcommittee

MEETING AGENDA

August 27, 2024

Location

Hybrid: Virtual/MDOT HQ Room 227

Time

1:00 PM to 3:00 PM

Purpose of Meeting

3rd Quarter Meeting - 2024

Invitees

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

AGENDA ITEMS

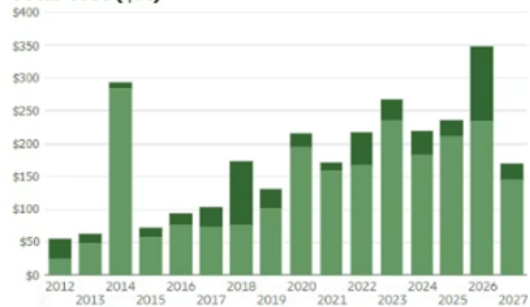
- Members
 - Ben's Last meeting – Shannon to take over as chair for next meeting
 - *Bryson to become chair for the next meeting, Shannon has a conflict*
 - Carl Ayers is sitting in for Bob Blunt
- Meeting Minutes Submission
 - Meeting minutes for Q2 were reviewed and have been posted to the ACEC website
 - Review/Questions/Follow up on Q2 meeting discussion
- Information Dissemination by MaineDOT
 - Contracting/workload:
 - *Developing the next workplan 2025-2027. Rich shared projected 2025/2026 project numbers. Steep increase in projects; 90ish projects in 2025, 110 in 2026 (see chart).*
 - *2024 was 69 projects at 219M*
 - *2025 is 73 projects (was 86)*
 - *2026 is 123 (was 106)*
 - *2027 Already at 34 projects, not including new work*

Year	# Proj's		Total Cost (\$M)		# Proj's	Total Cost (\$M)
	Other Bridge Work	Constr. or Replace	Other Bridge Work	Constr. or Replace		
2012	25	14	\$31.8	\$24.1	39	\$55.9
2013	32	18	\$14.5	\$47.9	50	\$62.3
2014	22	28	\$8.9	\$283.4	50	\$292.3
2015	29	19	\$15.4	\$57.3	48	\$72.7
2016	41	28	\$18.2	\$75.6	69	\$93.8
2017	59	24	\$29.3	\$74.4	83	\$103.7
2018	43	30	\$96.7	\$75.4	73	\$172.1
2019	41	35	\$28.4	\$101.6	76	\$130.0
2020	36	24	\$21.6	\$194.3	60	\$215.9
2021	19	24	\$14.0	\$158.1	43	\$172.1
2022	28	22	\$50.2	\$166.7	50	\$216.9
2023	37	25	\$32.2	\$235.4	62	\$267.5
2024	34	35	\$37.1	\$182.3	69	\$219.4
2025	29	44	\$25.2	\$210.7	73	\$235.9
2026	48	75	\$114.5	\$234.2	123	\$348.6
2027	4	30	\$24.7	\$144.3	34	\$169.0

Project Count



Total Cost (\$M)



- Departmentwide RFQ will be posted September 11th, 30 days to respond. Interviews anticipated early next year
- RFP for North bridge bundle – at least 7 firms applied (good turnout). Rich asked how the process went for the firms who submitted. H&A, VHB, TYLin indicated it was tight but doable
- 3 Design Build bridge project in Bangor RFP due later in fall
- Sydney to Waterville design build package. (applied for grant, got “pretty good results”, Recommended, not necessarily given).
- 6-9 bridges in 395 extension, includes Penobscot River crossing. DOT did not get favorable results in grant funding.
- Pursuing another Aquatic Organism Passage grant for 8-9 bridges. Most are already planned due to condition
- BDG update:
 - No sig. changes. HNTB is pencils down on chapters 1-3. Those Chapters to be sent out to ACEC and FHWA, hoping to send out within weeks (depending on workload)

- GCA Schedule:
 - *Per comments above, Departmentwide RFQ is posted September 11th, Due October 11th. Interviews anticipated early next year*
- Federal Grants & Federal Funding Updates:
- MaineDOT Staffing Update:
 - *Looking for entry level ATE's*
 - *Working to fill Senior PM role (Devan's opening)*
 - *Jerry Dostie (from Multi-Modal) moving to bridge program to be PM1 Team North*
 - *Stephen Cain moving to be Team South Utility Coordinator*
 - *added 2 new entry level designers spring summer*
- Standards Update (BDG, PDR/PIC, CADD, Notes) –
 - *The MaineDOT is now using a new scheduling program Primavera*
- OpenRoads update –
 - *Check in with CADD user group on information.*
- Summary of Designer Meetings
 - *Three meetings since last ACEC Bridge Subcommittee meeting*
 - *Meeting 1: Redi-Rock retaining wall systems.*
 - *Large precast concrete blocks. Freestanding and/or geogrid*
 - *North Haven and one other project highlighted.*
 - *It doesn't fit neatly into pay items, needs special provision*
 - *It doesn't use metal in geogrid*
 - *Meeting 2: Three topics*
 - *Topic 1: Integral abutment pile designs*
 - *AASHTO changed language regarding compactness*
 - *Leaning toward following new AASHTO guidance instead of VTrans guidance which may change pile size. Raise issue with Sr. Structural if this is causing issues (new method is more conservative)*
 - *Topic 2: Welds for manufacturer design bearings*
 - *Some confusion regarding responsibility for weld design. Standard specs put this on manufacturer, but they may push*

back; possibly include a plan note to bring attention to it. In general no welds front and back, only along sides (use sealer front/back).

- *Topic 3: Special Provision, 520 expansion joint modifications*
 - *General info on what this is & how it is handled internal to DOT for new designers*
 - *WIN 018939.00 uses all types except type 3 and WIN 025151.00 uses type 3*
 - *5 types, there is a pay item for each. USE THESE ON ALL PROJECTS. Only use new pay item if deemed okay by Sr. Structural and is a unique situation.*
- *Meeting 3: 5 topics*
 - *Topic 1: Special Provision 403 pavement*
 - *Designers to do pavement design on their own, checked by DOT rep.*
 - *Base likely goes from 18" to 20" on many small projects. Past PIC proceed with what is already determined*
 - *Topic 2: Anchor bolt length when dealing with Integral wearing surfaces*
 - *DOT will update the standard note and just use the dimension in the Standard Details*
 - *Topic 3: General Construction Note regarding elevation for granular borrow. Make sure that quantities and estimate consider how note is written (project had higher price due to variance)*
 - *Topic 4: Trainings*
 - *Ron to select NHI bridge rating training, Bridge design to select NHI hydraulic training*
 - *NHI Hydraulic training is Instructor led for about 1/3, otherwise self-guided. Ultimately decided to proceed. (January/February)*
 - *Topic 5: ENV taking over NEPA certification.*
 - *Responsibility for determining if there is a headwater change. If possible make all designs so that 100 year event headwater elevation does not increase. (Separate from FEMA requirement <1' rise. NEPA requires no rise)*

- Geotechnical Update (Laura K.)
 - *No updates*
- Discussion Topics
 - Review Committee Guidelines and Roles
 - *Rich will forward an ACEC/MaineDOT Bridge Design Subcommittee 2023 Goals, see screen shot.*

Possible technical and business practice topics for discussion over the next year are as follows:

- - Integral wearing surfaces on bridge decks.
 - Concrete quality (shrinkage cracks).
 - TAME committee, scheduling, and checkpoint reviews/assessments during PDR phase.
 - Review of Bridge Design Guide amendments as they are proposed by the Department and Consultant. BDG updates and plan process.
 - CADD training and Bridge Plan Development Guide updates.
 - Recommend training.
 - Cost estimating – sharing trends in construction costs.
 - Knowledge transfer on new products/materials being used on MaineDOT projects.
 - Reuse of existing substructure elements and scour analysis.
 - Identification of opportunities to streamline project delivery and improve efficiency.
 - Public meeting performance.
 - Construction and maintenance lessons learned.
 - Collaborative review processes (online reviews via Bluebeam).
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- Possible technical and business practice topics. *Work to gather information in advance of meetings to share with MaineDOT. The following is the discussion had during meeting on the topics*
 - Integral wearing surfaces on continuous bridges. (keep in list)
 - *Shrinkage* crack concrete mixes (Keep in list)
 - *MaineDOT* is doing internal testing to compare to industry. End goal may be adding language to spec which require shrinkage. Likely looking at lower cement content. Better distribution of aggregates. Goal is to work with industry.
 - Base line, then changes, then pilot project
 - TAME Committee (strike from list)
 - *Include documentation in PDR if bridge closures are recommended. MaineDOT* does have internal memo with list of things to consider as justifications to closure. *MaineDOT* to send out after they review.
 - Review of BDG *amendments*, etc. (keep in, but for discussion on new sections as they get developed).
 - CADD Training (convert to ORD item?)
 - Recommended Training (perpetual item, keep)
 - Cost estimating (keep)

- *See discussion on price volatility below*
 - Knowledge transfer on new products/materials (keep)
 - Reuse existing abutments for scour protection (possible)
 - *Scour is challenging subject to discuss since there are so many variables.*
 - *Typically have been assuming heavy riprap for scour*
 - Public meeting performance (strike)
 - *Coordinate with PM since each Project is unique*
 - Construction and maintenance lessons learned (keep)
 - *Potential for consultant to coordinate with Residents in winter/off season.*
 - Collaborative review processes (online reviews via bluebeam) (keep for now)
 - *Many PMs use Adobe, so platform not consistent*
 - *Coordinate with PMs on each project*
 - File Sharing Improvements
 - *Coordinate with PM*
 - i. *Sharing project information with consultants is not straight forward due to sensitive information and working files that may be construed as final.*
- Ways to improve information sharing/process from ACEC subcommittee meetings
- How to approach price volatility in project estimates
 - *Consultants typically use costs from current projects, but gathering data is not efficient and doesn't provide good data points*
The MaineDOT illustrated the Cost History used in house. The data information needs to viewed with a gain of salt due to variables; how data is inputted, Contractor bidding, Project location, etc. Would the MaineDOT be willing to share Cost History Information with consultants? Good topic for Consultants to dig into and provide information back to MaineDOT.
- Additional Topics Raised in Meeting
- Suggestions for Future Discussion Topics
 - *See Discussion above*

- Training Needs:
 - *Hydraulic training likely Q1 2025. NHI moved to mixed virtual/in person. More to come. (135090 is target course)*
 - *Load rating training. May be coming. (NHI course)*
 - *MIDAS training to be coming. Room for 2 per consultant. In person in Portland. Touch base internally and reach out to Tim with questions*

- 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

- The Next Meeting is set for:
 - *TBD, second week of December after the Transportation Conference*

DESIGNERS MEETING

Minutes for July 22, 2024

2:30 PM – 3:30 PM

Erin Brewer, Secretary

TOPICS

- **Topic 1: Redi-Rock**

Topic 1: Redi Rock Presentation

Applications

- Offers gravity walls, reinforced solutions, freestanding, and other customizable wall options
- Can be used for abutments (earliest one done in 2006)
- RediRock can be used in emergency situations very easily (quick set-up)

Precast Modular Block (PMB)

- Good for ROW impact issues and can be built in front of failed retaining structures
- Considered a “flexible” system
- Does not need to go down to the frost line (according to Redi-Rock)
 - Must confirm with geotechs that this is true before implementing
- Uses knobs to easily install
- Weed prevention is used between the joints in each block

Technical Resources

- Offers preliminary design charts (in ASD)
- Offers wall design software (free)
- Can be used in water
 - Conceptual sea wall details are available
- Precast Modular Block Design Manual available on their website

Drain

- Weep holes can be in between blocks
- Can install large holes for utilities or drainage through the wall by using a concrete collar

Specifying Redi-Rock

- Precast Modular Block (on the website) include in a spec
- Is on the MaineDOT qualified products list (672 and 673)
- Alternative with Novom (smaller unit)

Gravity Walls

- Over 20 feet tall
- Drainage goes through the blocks (solid & hollow core blocks)

- Batters
 - 0°-47.3°
 - Most common is 5°

Maine Projects

- China Lake Causeway Improvement (Fall 2020)
- City of North Haven (used in salt water)
 - Used geofabric reinforced wall instead of using geogrid

Reinforced Walls

- Use blocks attached to geogrid strip



- Geogrids are nonreactive (chemically)
- Can easily place utilities

Hybrid Walls

- Gravity on top of reinforced wall
- Wingwalls can be reinforced with gravity by the abutment
- Can integrate rails on top of the wall
- Can use cast-in-place coping on the top
- Can integrate moment slab that is TL-4 rated with the wall

End of agenda

DESIGNERS MEETING

Minutes for July 24, 2024

1:00 PM – 2:00 PM

Erin Brewer, Secretary

TOPICS

- **Topic 1: Integral Abutment Pile Design – VTrans Design Guide**
- **Topic 2: Welds for Manufacturer designed bearings**
- **Topic 3: Recurring Special Provision 520 – Joint Modifications**

Topic 1: Integral Abutment Pile Design – VTrans Design Guide

- [VTrans Integral Abutment Bridge Design Guidelines](#) was created in 2008, be aware of how changes in AASHTO may have affected the design guidance
- The VTrans interaction equation used the old AASHTO spec
 - Current AASHTO Section 6.9.2.2.1 has a caveat for if the piles are compact or noncompact
 - All of our typical HP piles we use are noncompact which, based on the current AASHTO code would use equation (6.9.2.2.1-3)
 - Noncompact piles use the equation that was added to AASHTO that is not included in VTrans
 - Update the plastic moment calculation in VTrans accordingly

Topic 2: Welds for Manufacturer designed bearings

Who is responsible for designing the weld between sole plate and girder?

- There was an RFI from the Contractor for WIN 023505.00 on the type of weld to use at one of these bearings so there seems to be some confusion on who is responsible for the weld
- Standard Specification Section 523.30 on Pot or Disc Bearings states:
 - Except where indicated on the Plans, the design shall also include the connections between the bearings and the superstructure, and the bearings and the substructure, along with adequate provisions for hold-downs equal to the tensile strength of the anchor rods
- [AASHTO/NSBA G9.1](#) (Detail H1.5, H1.6) supports that the bearing designer should also design the connection weld
- **Fabricator/Contractor will be responsible for the weld design when they are designing pot or disc bearings**
- There might be pushback from the Fabricators since there has been some on who is responsible for the anchor rod design
- Erin will ask RJ Watson their thoughts on designing the weld
 - RJ Watson said they typically show the weld detail on the shop drawing

The Weld

- Typically fillet weld, whose size is controlled by the minimum size of fillet weld in AASHTO Table 6.13.3.4-1
- Discussion about if weld should go all the way around or not
 - It may be difficult to weld the connection all the way around when there is an abutment backwall to contend with
 - **[AASHTO/NSBA G9.1](#) Section 3.3.4 recommends welding the sides of the bearing, not the front and back for sealing. To seal the front and back use a sealant**

Topic 3: Recurring Special Provision 520 – Joint Modifications

Background

- Traditional Joints (found in Standard Details)
 - Gland seal
 - Compression seal
 - Finger joint (open joint)
- BDG Section 10.4 has the 5 types of Joint Modifications described
- Example Projects:
 - South Portland (WIN 018939.00) has examples of all types except Type 3
 - Brunswick, River Road Bridge (WIN 025151.00) uses Joint Modification Type 3

The Special Provision

- Recurring Special Provisions are found in the R drive
 - Consensus was to add the info from the Special Provision into the Standard Specifications
 - Try not to use letters in Joint Modification Type Item numbers
 - Can only use letters if only one side of the joint is being repaired and the other is not
 - Rich will ask Eric's opinion on the Standard Specification solution
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End of Minutes

DESIGNERS MEETING

Minutes for August 14, 2024

1:00 PM – 2:00 PM

Erin Brewer, Secretary

TOPICS

- **Topic 1: Special Provision on Item 503 - Pavement**
- **Topic 2: Bridge rail anchor bolt lengths with integral concrete wearing surface bridges**
- **Topic 3: Embankment material estimating**
- **Topic 4: Trainings**
- **Topic 5: NEPA/FEMA hydraulic requirements**

Topic 1: Special Provision on Item 403 - Pavement

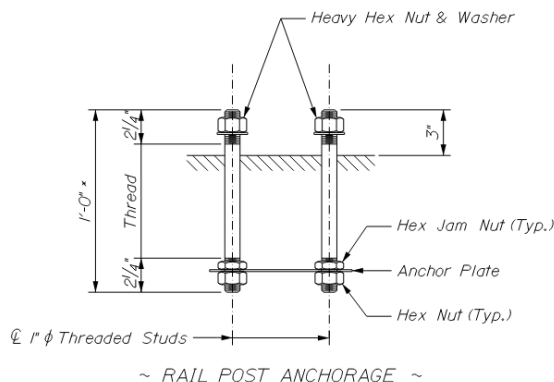
- [Design guidance for pavement](#) was updated in May 2024
- This update changed the minimum ASG to be 20” instead of 18” along with changing some of the tables within the design guidance
- If the project is past PIC and if this causes it to change a lot this can be grandfathered in

Designer’s Responsibility

- Each designer will determine percent passing #200 sieve to provide to Devan
 - Devan is the current point person for the SP, though Casey will be taking over
 - Draft SP’s can now be provided during preliminary design
- Follow the guidance to figure out ESAL values

Topic 2: Bridge rail anchor bolt lengths with integral concrete wearing surface bridges

- The most recent Standard Detail 507(09) was updated for integral concrete wearing surfaces



* = 9" for curb with integral concrete wearing surface.

TS 244.5.2 (TYP) 23/24

- The Standard Superstructure Notes on the planset include a note about shortening the anchor rods, when they have already been shortened in the Standard Detail
- **We should remove the Standard Note, use the 9” shown in the Standard Detail**
 - Remove the Standard Note in the cell in Microstation
 - Update word doc in the R drive to remove the Superstructure Note

Topic 3: Embankment material estimating

Webster, Mattagodus Bridge WIN 022266.00

- There was an inconsistency with the General Construction Note on granular borrow and the estimate which provided inaccurate quantities for common borrow and granular borrow

General Construction Note

7. All embankment material, except as otherwise shown, placed below EL. 123.0 shall be Granular Borrow meeting the requirements of Standard Specifications Subsection 703.19, Granular Borrow, for Material for Underwater Backfill, with the additional requirement that the maximum particle size shall be limited to 4 inches.

- **This note needs to be considered when estimating the common borrow and granular borrow quantities**

Topic 4: Trainings

Hydraulic Training

- Provided by NHI as a Webinar with student lead training (problems outside of class)
- This will be useful to the engineers in-house as well as for consultants
- Training lasts about a week
- Training will most likely occur during Quarter 1 of next year

Bridge Rating Course

- Ron Taylor was trying to do a Bridge Rating course
- Course is on the MBE and LRFR
- Most likely occurring in October 2024

Topic 5: NEPA/FEMA hydraulic requirements

- NEPA requirements are being taken over in-house by our ENV team
 - **We need to make sure that design Q100 headwater elevation does not increase when going from the existing bridge to the proposed bridge**
 - Most likely an issue when going from a span to a box
 - Required on a FEMA floodway, if it's a NEPA thing then we can explain it
 - If that can't be achieved, talk to ENV as soon as possible to justify the raise in Q100 headwater depth

End of Minutes