

ACEC/Maine DOT Bridge Design Subcommittee

MEETING MINUTES

December 10, 2019

Location

MaineDOT, Room # 421 A-B

Time

1:00 PM to 3:00 PM

Purpose of Meeting

4th Quarter Meeting - 2019

Invitees

Wayne Frankhauser, MaineDOT
★ Jeff Folsom, MaineDOT
 Leanne Timberlake, MaineDOT
★ Rich Myers, MaineDOT
★ Garrett Gustafson, MaineDOT
★ Laura Krusinski, MaineDOT
 Kathy Parlin, MaineDOT

Ben Foster, MaineDOT
★ Theresa McAuliffe, McFarland Johnson
★ Jenn MacGregor, Kleinfelder
★ Jaime French, Fuss & O'Neill
★ Adam Stockin, WSP
 Josh Olund, HNTB

AGENDA ITEMS

1. Introductions
 - a. This meeting was Theresa's last.
 - b. Jason Gallant, HDR will be joining us next meeting in March (Q1-20 thru Q4-21)
2. Information Dissemination by MaineDOT
 - a. Contracting /workload
 - The work plan looks a lot different this year.
 - \$105 million is the typical allocation
 - \$70 million for supplemental cost from 2020-2021
 - \$30 million remaining - match for grants. 15 larger projects – replacements. All but one are "PE only" projects. 2 BUILD grants and one INFRA grant application.
 - Moving 9 paints, rehabs, culvert replacements from this year's program to next
 - 2020 – 44 projects – \$207 million (including grants)
 - 2021 – 56 projects – \$200 million (including grants)
 - 2022 – 50 projects – \$144 million (including grants)
 - Station 46 Bridge- This project is a 2019 BUILD grant candidate (former TIGER grant program) with the expected construction cost is \$30 million with half the cost funded by MaineDOT.
 - BUILD grant approved 2021 delivery – design underway

- Bundled Bridges- Two bundles have been developed; one in Franklin County and one for interstate bridges in the Yarmouth area. Funding will be split 80/20. Projects will be funded 50% in next program. Department received \$18 million.
 - Fully funded and under design
- The Department-wide RFQ is underway.
 - First scoring meeting today, Decisions likely not until March. 40 firms submitted for Bridge.

b. MaineDOT Staffing Update:

- New Employees - 3 new assistant engineers (2 on South team, 1 Geotech) – 2 have started and 1 will start in May

3. Summary of Designer Meetings (Rich, Garrett)

a. MASH Railing Update:

- 3 bar steel rail standard detail- still working on standards such as the 3 bar rail transition. They will follow up modeling and simulation to check a couple of things. MaineDOT to figure out how to accommodate a larger expansion joint.
- Jeff to share report with the group. NETC rail passed the simulations. Next steps at DOT. Federal Highway has delegated the responsibility of crash testing to the states. Maine feels that they can move forward without crash testing. NH likely to follow along with Maine. MaineDOT looked at wider post spacing to accommodate larger skew and modular joint.
- Bridge posts size to remain as is. Doesn't change occupant risk. Larger posts transmit more force into the anchor bolts and therefore rebar. One additional call with federal highway to confirm direction. Deadline the end of 2019. Detailing ready to go, just need to issue a supplemental. The plans should reflect the new rail.
- Change in guardrail layout due to the midway splice.
- Flared terminals do not meet MASH, however feds have given approval 31" tall 350 flares continue to use until MASH becomes available.
- MASH TL-4 system. Will modify standard details. Prefer single slope barrier with prior tested detail.

b. Standard toe wall detail has been revised.

c. Special Detour will include the barrier. It will now be incidental. Other items will be paid separately. This spring new SP was released.

d. Milling of concrete deck. Overcast concrete deck. 1/2" to start, then had to increase to 3/4" because we were not able to get to the curb face and or scupper. Had to finish up 3/4" and had to taper to finished grade at the curblines. Still only want to do on lower volume roads. Will try different approach, to set the deck at 3 percent and then mill it at 2 percent. Cost is the biggest factor to go this route over long joint.

- e. Adam checked in with NHDOT on diamond grinding. Please see attached NH Specification. More extensive information can be provided on request.

4. Discussion Topics

a. Geotechnical (Laura K.)

- Cohesive Soil Scour: FHWA testing at the Scarborough Maintenance Lot completed in July 2019.
 - Technical update to HEC 18
- Final EDC5 progress report was submitted in July 2019.
 - Brewer Edington for using proven yet under utilized geotech tools,...haven't heard back from the agency yet for Phase 2 geotech explorations. Not started yet.

b. Continuation of previous discussion

- ACEC NH- Knowledge Share- Adam Stockin
 - NH moving to metalize all overpass structures - projects are typically 10 mil thick (within +/- 2 mils) metalizing with a clear sealer coat.
 - New UHPC metal fiber which meets "Buy America". Fibercon International.
- Ideas for streamlining project development & delivery
 - Semi-Final Plans submission deliverables
 - Supplemental Special Provisions
 - When to receive a list of SPs? 60% plans should include a list of special provisions. DOT and consultant to decided case by case who does which and what is important
 - Finalizing standard notes - Garrett and Rich – end of January for majority - then get it published in Microstation format to be included – will post and put into word –
- Updates to "2003 BDG with updates through June 2018" – Potential Items that the Consultants can support DOT
 - References to Standard Specifications which are outdated
 - Geotechnical (Sections 2.5 & 2.10, & standard notes) – Jenn
 - Steel Girders
 - Beam seats
 - Integral abutments
 - Loads
- There is no current plan to update the BDG, though MaineDOT would like feedback for "When are you looking for something and not be able to find it", and/or "what sections are obsolete and can be deleted."
- Updates to construction cost estimating data & methods

- MaineDOT pursuing placing the estimator catalog file on the website. Will need approval from Rich Crawford.
- PIC submittals and Utility \ ROW Coordination
 - Is this an item the Consultants could assist DOT with developing a checklist?
 - Forthcoming memo on what is required for PDR and PIC.
- A possible query of Bridge GCA firms to solicit feedback on items that would benefit from greater clarity and to identify common challenges. – part of BDG updates?
 - Garrett has compiled feedback. Will send to Rich, Jeff and Laura for review. Might provide guidance on the BDG topics. He will likely send it out to GCA list.
- MaineDOT CADD standards and deliverables.
 - Still having issues with CAD standards. Producing a road map of expectations. May make sense to enable consultants and DOT CAD staff to touch base to help the learning curve. Talked about a workshop or possible webinar to share this information.
- Low Shrinkage Concrete – Durability testing is being completed on the Jonesport-Beals Bridge. UMaine has a new lab to investigate concrete durability (partnering with MaineDOT and VTrans).
 - 2 results from test apparatus and one was LP and one was an A mix. A mix showed more shrinkage. Jeff pushing the lab to test more suppliers to determine where Class A will land.
 - Bob Blunt was contacted and stated that the Department is looking into furthering the research in the coming year.
- Computer simulation for MASH crash testing - NETC style rail, 3-bar, 4-bar, NH style (steel) transitions and Maine style (concrete) transitions. No concrete barrier will be included in the study. Railings passed simulations.
 - Any changes to standard details? See above discussion.
- Bare Concrete Decks:
 - Class A vs Class LP - Both mixes have been merging closer together. Likely going to Class A. More of a focus on low shrinkage as opposed to low permeability. Further Testing to help determine.
- c. New discussion items
 - Integral abutments – orientation of wingwalls, span length limitations?
 - Hold discussion for next meeting
- d. Potential future discussion topics
 - Research project for integral abutments supporting curved bridges

e. Training Areas

- Topics related to up-coming projects/program goals?
 - NHI Rehabilitation course – rehabilitation maybe have someone from MaineDOT to attend.
 - *NHDOT is looking into hosting this training in 2020*
- Micropile Design
 - *NHDOT is looking into hosting this training in 2020*
- P/S Concrete Beam Design?
- Structural Stability in Bridge Construction?
- Bentley ?
 - RC Pier
 - PS Girders

5. Discussion of goals (see revised 2020 Goal Document)

- a. BDG updates
 - Community survey to help with development
 - Outline for the new manual
- b. CADD training and plan development
- c. Cost estimating
- d. Streamline project delivery and improved efficiency
- e. Plan Impacts Complete milestone
- f. Knowledge transfer on new products/material being used on MaineDOT projects.

6. Subcommittee Rotation for Consultants

(2-yr rotations for new members joining 2014 and later)

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|--|----------------------|
| a. Theresa McAuliffe, McFarland Johnson | Q1 2018 thru Q4 2019 |
| b. Jennifer McGregor, Kleinfelder (Geotech Rep) | Q2 2018 thru Q2 2020 |
| c. Jaime French, Fuss & O'Neill | Q2 2018 thru Q2 2020 |
| d. Adam Stockin, WSP | Q4 2018 thru Q3 2020 |
| e. Josh Olund, HNTB | Q2 2019 thru Q1 2021 |
| f. Jason Gallant, HDR | Q1 2020 thru Q4 2021 |

7. The Next Meeting is set for Tuesday, March 10 at 1 p.m.

ACEC/MaineDOT Bridge Design Subcommittee

2020 Goals

In accordance with the request of the Transportation Committee, the parent committee to the Bridge Design Subcommittee, the following draft plan is offered for consideration. The Plan was formulated by the consultant community subcommittee members (Consultants) and the MaineDOT subcommittee members (Department) at the fourth quarter 2016 subcommittee meeting.

Core Goals of the Bridge Design Subcommittee:

1. Maintain quarterly subcommittee meetings and provide approved minutes for posting to ACEC website - Goal is 1 month from meeting date.
2. Foster mutually beneficial training opportunities through FHWA or other resources.
3. Provide Consultant technical expertise for the Department's consideration on issues of interest.
4. Discuss and review technical and/or project development topics with the Bridge Program.
5. Disseminate Department provided information to bridge designers throughout the ACEC community and promote ACEC community feedback to the Department.

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

- 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 suggested edits.
 - Survey for information needed and policy gaps
 - Prepare BDG outline/table of contents
 - Topics to include:
 - Consistency in corrosion resistant reinforcement selections and guidance.
 - Permanent implementation of composites in bridge construction.
 - Reuse of existing substructure elements. (Ch 10)
 - Identification of opportunities to streamline project delivery and improve efficiency.
 - Publish PDF with embedded links
- Work with MEDOT to present series workshops on development of CADDfiles
- Environmental restrictions and the project delivery process incl. Section 7, Aquatic, Mammals, etc.
- Habitat connectivity design
- Cost estimating – sharing trends in construction costs.
- Knowledge transfer on new products/materials being used on MaineDOT projects.
- Best practices for detail build structures
- Filled rip rap

STEWARTSTOWN, NH - CANAAN, VT
15838

October 26, 2015

SPECIAL PROVISION

AMENDMENT TO SECTION 628 -- SAWED PAVEMENT

Item 628.5 – Diamond Grinding Concrete Pavement

Add to Description:

1.3 This work shall consist of diamond grinding the top surface of a portland cement concrete bridge deck or approach slab, at the locations indicated on the Contract Plans.

Amend 3.2 to read:

3.2 The equipment used to diamond grind the top surface of concrete bridge deck or approach slab shall be a self-propelled machine specifically designed to smooth and texture portland cement concrete, equipped with diamond tipped saw blades.

3.2.1 All equipment used to diamond grind shall be subject to the approval of the Engineer, prior to the start of work.

Add to Construction Requirements:

3.5 The concrete structural slab shall be diamond ground after it has reached an age of 14 days or a minimum compressive strength of 3500 psi.

3.6 Grinding shall be longitudinal, and shall begin and end at lines normal to the pavement centerline in any ground section. The diamond ground surface shall be uniform in appearance with a longitudinal corduroy type texture. The grooves shall be between 0.10 and 0.15 inches wide. The land area between the grooves shall be between 0.065 and 0.125 inches. The peak of the ridges shall be approximately 1/16 inch higher than the bottom of the grooves.

3.6.1 On curved decks, each pass of the diamond grinding machine shall begin on the side of the deck having the smaller radius.

3.6.2 The cutting of grooves over an area already grooved will not be permitted. No cutting blade shall be introduced into an already established groove.

3.6.3 During the diamond grinding operations, the Engineer will verify, at random, that the desired groove depth is being achieved. If it is determined that the desired groove depth is not being achieved, the Contractor shall stop the grooving operations and make the necessary adjustments.

3.6.3.1 The Contractor shall supply the Engineer with two accurate easily readable, gages with which to verify the groove depth. The gauges shall be made available to the Engineer one week prior to the anticipated start of the grooving operation. Gauges shall be accompanied by manufacturers instructions for their use, if deemed necessary.

3.7 Slurry, or debris, from the diamond grinding operation shall be continuously removed. The slurry, or debris, shall be disposed of properly by the Contractor.

Add to Method of Measurement:

4.2 Diamond grinding concrete pavement will be measured by the square yard of total surface area to be grooved as noted on the plans.

Add to Basis of Payment:

5.3 The accepted quantity of diamond grinding concrete pavement will be paid for at the contract unit price per square yard complete in place.

5.3.1 No separate payment will be made for supplied gauges.

Add to Pay items and units

628.5	Diamond Grinding Concrete Pavement	Square Yard
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Designers Meeting Minutes

November 20, 2019

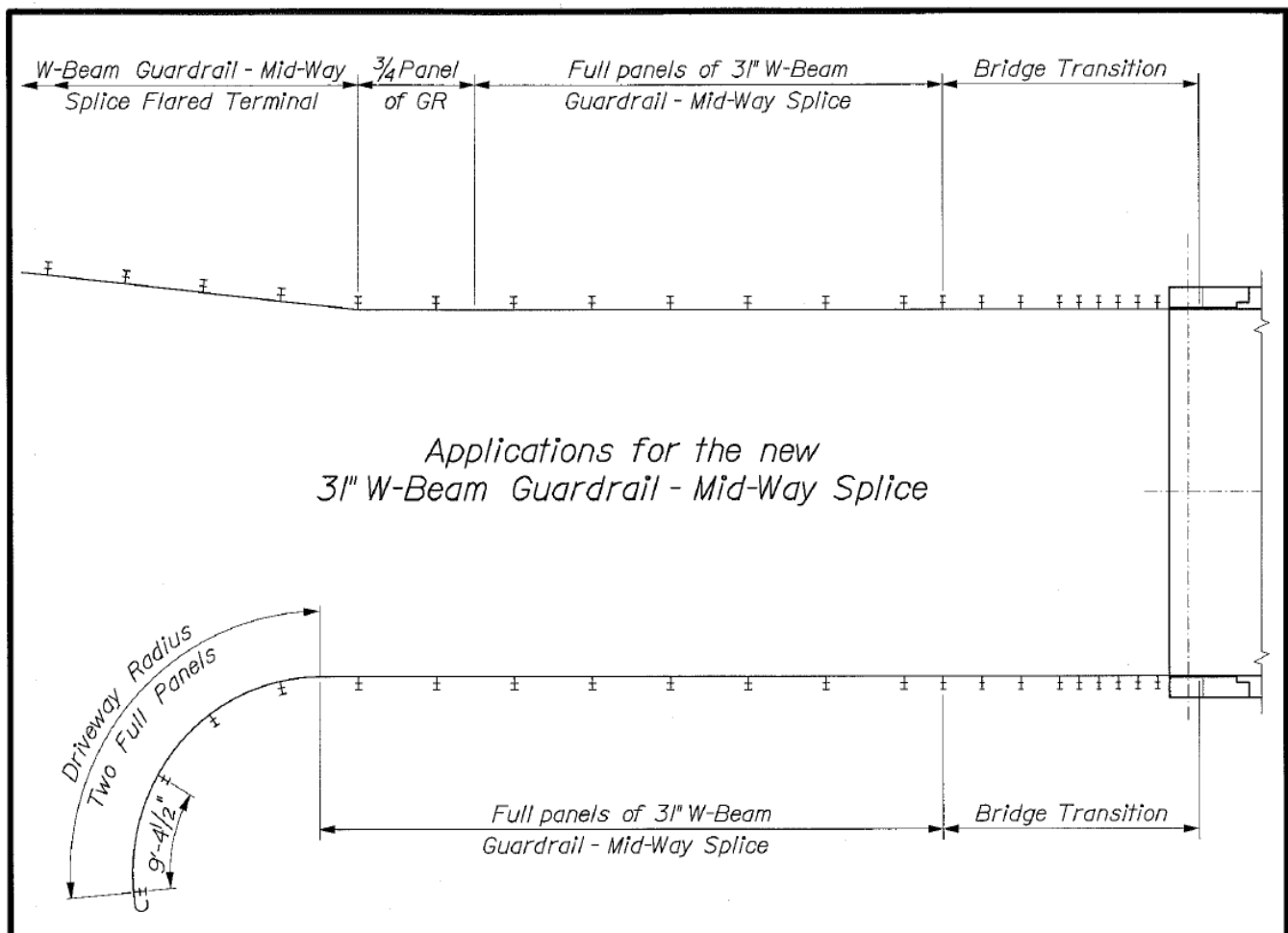
Conference Room 317 A&B

1:00-2:30 PM

Page 1 of 6

1. Guardrail Layout and Status of Flared Terminals

Rich Myers - 15 minutes



- 1- Because we transitioned to using mid-way splice guardrail, rail length and post layout have to be modified because we still have the bridge transition and terminal ends at a post.
- 2- Currently we have 1-3/4 rail panel at the transition and 2-3/4 rail panels at the rail terminal. The sketch above suggests removing the 3-3/4 panels and have only 1-3/4 panel at the splice flared terminal.

Designers Meeting Minutes

November 20, 2019

Conference Room 317 A&B

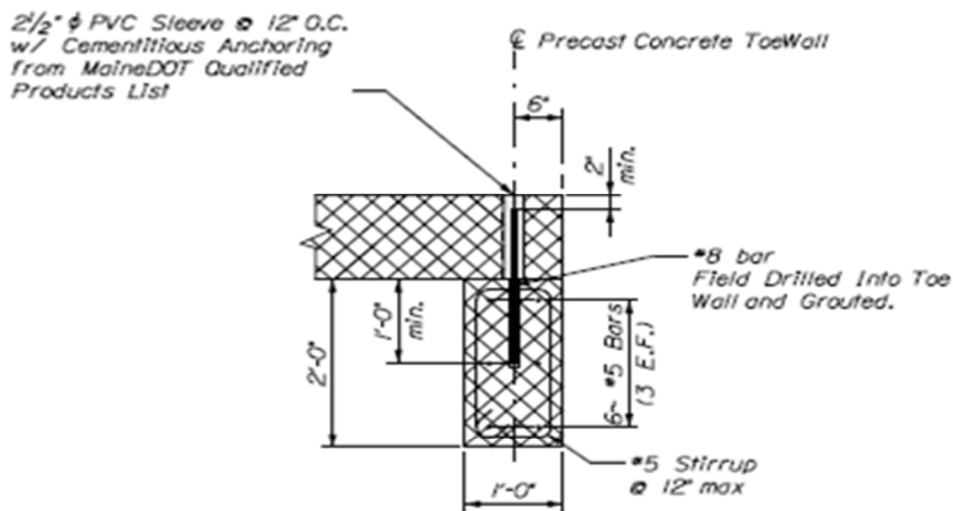
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Page 2 of 6

- 3- To get the field folks to comply with MASH requirements, the details must be modified in an updated SP for the specific project to reflect the above. The other way we can go is to modify our typical details.
- 4- Another issue is that how do we handle a transition section that goes right into a flared section. This and other cases are special cases that should be handled individually. At least the consensus is that we shall have one typical detail that is more general.
- 5- In terms of the status of flared terminals, we have 31" midway splice, and then we have to install MASH approved end treatment which you cannot get most of the time. In addition, roadside hardware should comply with Mash 2016. In this case, it was agreed that States can use whatever they have, to comply with NCHRP 350 flares.

2. New Standard for Toe Wall detailing for Box Culverts

Kendra Nash – Lovell Creek Project – 10 minutes



PRECAST CONCRETE TOEWALL DETAIL

Designers Meeting Minutes

November 20, 2019

Conference Room 317 A&B

1:00-2:30 PM

Page 3 of 6

- 1- The detail above show field drilling into toe-wall of a Concrete Box culvert that will be particularly used in Lovell Creek culvert project. The precast bottom slab end is anchored to the toe wall with #8 Rebar. There were questions whether a 2 ½ inch pipe sleeve should be used in the slab, and drilling only in the toe wall, or should we also drill through the slab, thereby eliminating the sleeve. The general opinion was in favor of keeping the sleeve to limit drilling only in the toe wall.
- 2- The next concern was that if we specify the reinforcement, spacing, and embedment, then we assume some level of responsibility should the concrete crack. The general thought that this detail with #8 @ 12 inches provides more reinforcing than previous #8 @ 24, or more spacing, and that we are improving the resistance to cracking by providing more reinforcement.
- 3- The idea of friction fit which is achieved by hammering the anchor rod into a tight hole thereby eliminating grouting requirements was dismissed because of the danger of cracking the concrete under confinement stress from the hammering operation.
- 4- The consensus was that contractors and fabricators could not be trusted to do this work on their own without providing them with a detail such as the one above to execute.
- 5- Most agree that the above detail should become typical for use in other similar projects where precast concrete box culvert with a precast concrete toe wall is used.

Designers Meeting Minutes

November 20, 2019

Conference Room 317 A&B

1:00-2:30 PM

Page 4 of 6

3. Payment for Temporary Concrete Barrier used as part of Special Detour

Rich Myers – 10 minutes

Anson
WIN 021657.00
November 15, 2019

SPECIAL PROVISION
SECTION 510
SPECIAL DETOURS
(Guardrail and Barrier)

This specification is amended as follows:

510.032(c) Approach Road Guardrail

This subsection is replaced with the following:

The Special Detour approaches shall have guardrail or concrete barrier where side slopes are steeper than 3 horizontal to 1 vertical, or as specified on the Plans. Approach guardrail shall be Type 3 guardrail or an approved equal and shall be attached to the bridge rail in a manner that develops the guardrail in tension. Approach barrier shall be attached to the bridge rail with a rigid connection with a similar strength capacity to the bridge rail. If the Plans specify a type of rail or barrier, that type shall be used.

The termination of approach guardrail or barrier and the end treatment of the rail shall be in accordance with the current AASHTO Roadside Design Guide.

510.09 Basis of Payment

This subsection is amended as follows:

The following sentence is inserted in the first paragraph after the second sentence:

All guardrail or concrete barrier required solely for the Special Detour shall be incidental to this item.

The second paragraph is replaced with the following:

Traffic control devices, work zone crash cushions, temporary erosion control, pavement, and dust control will be paid for in accordance with the applicable Contract items.

Designers Meeting Minutes

November 20, 2019

Conference Room 317 A&B

1:00-2:30 PM

Page 5 of 6

- 1- There has been a debate over a long time whether roadside barrier used in special detours should be considered incidental to pay items. Contractors use temporary concrete barriers in special detours and rarely if ever they use a guard rail.
- 2- Normally we have a pay item for special detour and a separate pay item of temporary barriers. We want to try making any barrier used in a special detour as an incidental item. This can be achieved by providing a SP that spells what is paid for and what is incidental to eliminate ambiguity and confusion. However Crash Cushions will still have to be paid for separately. SPs such as the one attached should serve that purpose.
- 3- Based on field personnel, the contractors normally have temporary concrete barriers as part of the special detour supplies, and providing a separate pay item for barriers only increase their income for an item they already have. Also, including this as lump sum item does not help because at the end of the day the contractor will end up charging for the total length of barrier used regardless of what is spelled out in the contract, and specifying the barriers as incidental will not make much difference when it comes to cost.

4. Pro's, Con's and Lessons Learned from the Milled Concrete Wearing Surface Pilot Projects

Travis Hamel – 15 minutes

- 1- Milling concrete wearing surfaces has advantages and disadvantages. Travis presented some photos from milled and textured concrete wearing surface projects and explained the issues that arise in the operation.
- 2- On one of the photos where sagging was experienced or negative camber was present on a long multiple span bridge, the milling machine did not engage the wearing surface in the sagged spots or areas and full texturing was not achieved. The areas were filled with $\frac{3}{4}$ " thick concrete as a fill in, and $\frac{1}{2}$ " was removed through milling and texturing.

Designers Meeting Minutes

November 20, 2019

Conference Room 317 A&B

1:00-2:30 PM

Page 6 of 6

- 3- There is an advantage of saw cut grooving rather than milling and texturing that it is less expensive and much more adaptable to bridges with crown slopes and vertical profile irregularities.

- 4- Travis explained that milling machines has three sensors over their length and try to even out the operation by averaging out the distance over the sensors and follows grade. But this mainly works on flat uniform slopes and miss areas with sags and dips. Travis suggests that to achieve a 2% sloped crown, provide 3% crown and mill to 2%. This also gets rid of curb line finishing issues associated with this operation.

- 5- The question is how much added concrete we should provide on the wearing surface. As an example, add $\frac{3}{4}$ " and mill to $\frac{1}{2}$ ". Some suggested that we need at least $\frac{1}{2}$ " sacrificial material added as a dead load to consider in design.

- 6- The other issue that was discussed is whether the size of the deck placing crew can have an effect in the speed of concrete placing and finishing efficiency to avoid irregularities in the concrete finish, and thereby avoid problems of having insufficient and incomplete milling and texturing operation. Most agree that the more crew we have, the better is the concrete finish, and the better is the milling and texturing process. However, field personnel warned against specifying the number of crew personnel required in an SP because of the level of responsibility associated with this and extra cost that may be incurred by the contractor. The number of crew personnel used during the concreting and finishing process should be left to the contractor.

END OF MINUTES

By:

Roger Naous
Transportation Engineer II
Designers Meeting Secretary