

10:00 A.M. Wednesday February 28th, 2018 – Cambridge, Ontario

Present:

Kevin Williams (Chair)	Atlantic	Kamran Derayeh	ArcelorMittal
Jason Sherwood	Atlantic	Jim Evans	AK Steel
Riley Wilson	Atlantic	Dave Watson	Leland
Heba Ahmed	Armtec	Ray Wilcock	CSPI

Absent:

Phil Carroll	Atlantic	Byron Nelson	Leland
Nick Spence	Atlantic	Ian Berry	Warner
Shane Setter	Ironside	John Buckner	Tee Group
Randy McDonald	Armtec	Bruce Matheson	Frontier
Mike Mounts	Valfilm	Marc Warden	Hubbell

1. Welcome and Opening Remarks

Kevin Williams opened the meeting at 10:00 a.m. and welcomed everyone. Attendance was taken and is recorded above. Go-to-meeting was used.

2. Review Minutes from December 7th, 2017

Minutes were reviewed and a motion for approval was made by **Dave Watson**, second by **Kamran Derayeh**.

3. Outstanding Items to Complete

a) Bolt & Nut Research

- **MTQ Report update**
 - Still waiting to hear back from MTQ on bolt specification.
 - [Will follow up at April's TAC \(Standing Structures Committee\) meeting in Ottawa.](#)
- **Technical Bulletin sign off**
 - [Kevin to sign off before posting to the website \(members section\).](#)

b) Rehabilitation Gap Analysis Literature Review

- MTO issues requiring rehabilitation brought up at the 2017 buried bridge presentation:
 - Flattening of the crown
 - Seam openings – pull apart
 - Haunches buckling – invert rising
 - Crimping of the conduit walls (along the wall haunches)
 - Bolt hole tears
 - Excessive deformation of the conduit especially along the crown and shoulders
 - Water leakage along plate seams and through bolt holes
 - Corrosion and cross section losses (difficult to quantify and repair)

Kevin updated the committee on his discussion with Dr. Ian Moore from Queens University. The cost of the study would be in the neighbourhood of \$20,000. CSPI would contribute 1/3 and 2/3 from Mitacs if approved.

Action: Kevin to send Ray the information to move this project forward.

c) MTO – Structural Plate Standards Advancement

- Package was submitted digitally to Tony Merlo and Magdy Meleka on February 22nd as follows:

Research & White Papers

1. Report of abrasion testing by MTQ – 2012
2. Report of corrosion testing by MTQ – 2012
3. Plate durability white paper (Elzly) – 2012
4. TRB submission – added longevity - 2012
5. MTQ / CSPI European pavement tests- 2014
6. AREMA paper – Mulvoy, Oler – 2015

Technical Documents

1. CSPI bulletin 13 – Performance Guidelines for Buried Steel Structures
2. Warner Custom Coating
3. Long term field investigation of Polymer Coated CSP – NCSPA

Specifications

1. CSA G401-14 – section 4.5.5
2. ASTM A742M
3. MTO Design Build Spec – section 3271.05.06
4. Other - <https://ncspa.org/resources/calculators-charts-tools/material-description-and-specifications/>

Ontario Sites

1. List of Ontario polymer coated sites
2. Case Study – Bathurst Street
3. Case Study – Shamrock Lake

4. Town of Lakeshore
 5. Links to Canada's first installation in Kingston
<http://www.cspi.ca/node/412>
 6. Links to a few sites in Canada
<http://www.cspi.ca/map?pid=bc> See Port Hardy
<http://www.cspi.ca/map?pid=bc> See Delta
- **Municipalities Submission:**
 - Application and supporting documents are being put together to target 10 municipalities. This requires physical submission. Kevin suggested that LEED's information be included.

Action: Ray to update CSPI tech bulletin on recycled content to incorporate LEED information by Kamran (i.e. – Stan) before submitting.

d) Galvalume

- 2nd draft from Pete Ault was distributed to the committee for feedback.
- Line charts in Technical Bulletin 1 need to be sketched for 1.6mm & 2.0mm gauge by Pete for further review
 - Bar charts were approved
 - Kamran would like to see more emphasis / comment on the new soft water sites in Ontario & BC
 - The old sites locations are not readily available – Kamran will touch base with some colleagues
 - Ray will reach out again to NB DOT / NF DOT for test site
 - Ray will use the PosiTector to measure thickness at the next site visits this summer
 - Kevin would like to see more information on the chemistry science behind the coating performance in soil and various water environments
 - Kamran would like to see target dates and direction from the committee

Action: Ray to send to Pete the discussion points above.

Action: Committee to send in remaining comments by the end of March.

e) OPS Height of Cover Tables – final submission

- 805.020 CSP & SPCS Pipe-Arch
- Kevin & Heba held final discussions and were in agreement on the numbers
 - Milestone #5: April 30, 2018 – OPS Drainage Committee complete the review of the height of fill table material
 - Milestone #6: November 30, 2018 – publication of updated height of fill table in the OPS system

Action: Kevin to stamp and sign table 805.020

Action: Ray to submit final table to the OPSD committee on February 28th

f) Sustainability (EPD)

Ray gave an update on the overall project. Expect to receive final certified EPD in the next month.

Ray attended the MTO Stakeholders conference in January. Notes on climate change were as follows:

Climate Change	Ontario's plan is to reduce Greenhouse Gases by 80% by 2050 Ontario produces 25% of GHG in Canada Transportation produces 1/3, thus 8% in all of Canada 171 million tons of carbon dioxide
Current Mitigation	Recycling, alternative materials, life cycle analysis, renewable resources
Considerations	Costs, GHG emissions, using EPD's to quantify impact

g) NCSPA Polymer Coated Plate & Bolt Testing

- Phone conference was held on February 16th, minutes attached
- Kevin stated that Canadian product would not currently meet the initial ASTM draft
- Ian questioned a number of tests that are not included
- Future – align CSA with ASTM standard
- Dave mentioned that Leland has testing facilities that Ian may be able to use

Action: Ray to advise Ian and Mike McGough that the committee has agreed to participate in the NCSPA study. IB to advise if panels from NCSPA are required to perform tests on samples which NCSPA is not able to perform.

Action: IB to summarize comments and distribute.

Action: CSPI/NCSPA to jointly develop a list of relevant, prequalified tests for a barrier coating. PA and IB to lead.

4. Long Term Items

a) ASTM A742 Review & Testing

Ian agreed to proceed with the following tests:

- Adhesion in ASTM A742 (mandrel bend);
 - Adhesion in ASTM D3359
 - Boiling water adhesion test
 - Salt spray.
- Ian has reached out to a supplier for testing (external lab) – s/b completed by the end of the 1st Q 2018

- Ensure Mike McGough is aware of Ian's additional testing, and that the ASTM task group considers Ian's test results/methods as deemed appropriate (review with IB).

Ray attended a meeting chaired by Mike Mounts on January 31st to review changes pertaining to polymer laminated steel. Discussion points were as follows:

1. 6.1.1 states the steel sheet shall be treated with a chromic acid solution. Follow up with both ACI and Precoat is required, as Mike believes neither of them are currently using chromic acid due to the handling and waste treatment issues. Instead, both may use a chromate pre-treatment. According to the specification, the deposited chromium level should be between 135 and 190 mg/m², while Precoat may actively measure the chromium level, Mike does not think ACI is doing this measurement. He will follow-up with both to understand exactly how they are doing the pre-treatment and how they control it.

- ACI and Precoat say its okay as is. ACI doesn't measure consistently. No change needed.

2. 9.3 states the polymer coating thickness shall be measured according to ASTM D1005. This is one of the test methods Valfilm uses for measuring film thickness. However, this test method is based on using a micrometer to measure the coating thickness which requires the coating to be removed from the substrate in order to measure it. If the coating is properly applied to the substrate, there is no way you should be able to remove it. Therefore, rather than referencing this method, Mike would prefer to reference ASTM D7091 which is a non-destructive film thickness measurement test. The PosiTector coating thickness gauge that both ACI and Precoat use is covered by this test method.

- The PosiTector 6000 is okay to use with this method.

3. 9.5 states the abrasion resistance should be determined by ASTM D658. However, this test method has been withdrawn with no replacement. Mike McGough was asked what abrasion test method was being used for evaluating the polymer coated steel plate. Should that test method be referenced in this specification?

- Mike stated that a modified falling sand test, ASTM D698. Instead of sand, steel grit was used to accelerate the wear.
- How do we change 7.5?
- Mounts will determine how the abrasion coefficient is calculated for correlation to other test methods.

4. 9.8 states the weatherability should be measured using ASTM G23. This test method has been withdrawn, but it has been replaced with ASTM G152. We may need to conduct some testing to make sure the performance is the same using the different test method, although Mike thinks this is a weathering we had used in the past when at Dow. However, according to 7.8, the coated steel only needs to stand up to 100 hours of weathering without any signs of delamination or cracking, and this is a very short time period for a weathering test. In his experience, it will take several thousand hours in this type of test before there are any issues. Which begs the question if we should increase this time period to match the actual performance of TRENCHCOAT coated steel?

- Valfilm will have some test results with the new test method.

5. 9.9 states the resistance to microbial attack should be tested by ASTM G22. However, this test method has been withdrawn with no replacement. Mike is aware of another ASTM method, D4300, for testing the resistance of films to microbial attack. Again, it may require

some testing to determine how TRENCHCOAT coated steel performs using this test method.

- Mounts will research labs that perform the tests.
- G160 is another option to look into.

6. There isn't a requirement for salt spray testing, but everyone agrees that this is a very important performance test for polymer coated steel. Both ACI and Precoat currently do routine salt spray testing and Mike believes they are both going to 1500 hours with no creep (there is some historic data from Dow that TRENCHCOAT coated steel will last for over 3000 hours in the salt spray test). Do we want to consider adding this performance criteria to the ASTM specification?

- B117 is used in Canada.
- We should add the test with 1500 hrs.

7. It came across loud and clear at the NCPSA meeting that there needs to be some definition on what sort of damage needs to be repaired. For example, as Ray indicated, in the CSPI literature we have established that scratches less than 3 mm (1/8-inch) wide don't need to be repaired. Scratches from 3 mm to 50 mm (1/8 to 2 inches) can be repaired, and if the damage is over 50 mm, then the fabricator and the contractor need to agree on how to proceed. The other possible criteria at the meeting was damage less than 1 in² doesn't need to be repaired. Should we consider including this type of criteria in ASTM A742, or does it make more sense going into a different specification like ASTM A762?

- McGough will distribute language to TAC.
- We need to pull Tee Group into the discussion. Mounts will reach out to Marty Brickman.

b) SWM/Buried Bridge Action items – PPC Top 5 Items

Feedback from DOTS and Municipalities:

The five items as voted on by the committee at the December meeting were:

1. Municipalities – focus on standards for storm sewers and culverts
2. Education on durability / coatings available
3. Education on proper installation and manufacturing of polymer
4. Analysis for PEI DOT – bringing backfill in from N.B. (plate versus concrete envelopes)
5. a) Full review of the of the DGSSMS
b) Technical bulletin on alternatives to granular backfill

Number 1 & 2 are current projects for 2018. Kevin suggested a webinar on durability and installation. With regards to the PEI initiative and item 5b, Kevin suggested we wait for the release of the new CHBDC standard which will contain soil requirements for both steel and concrete.

Previous item: Jason suggested a life cycle cost analysis on the entire project of the Coquihalla highway. He suggested that CSPI could partner with BCMOT and University of British Columbia (grad student).

Ray reached out to Frank Dacho of BCMOT who responded that he is retiring in March. Alternative meetings have been set up in Coquitlam (David Woolford) and Victoria (Gary Farnden) and the University of BC (Yahya Nazhat) the end of March to determine interest.

c) Thermopolymer plate in brackish/salt water - Ray

There are three sites requiring a review (1 in BC, PQ & NS). MTQ are extremely interested in these sites as this is their number one concern.

- Ray will visit during 2018 summer and fall travel and will report back by the end of the year.

d) Technical Bulletin on Invert Reline - Ray

Action: Ray to draft a technical bulletin using the article from Sweden in 2018 by 3rd Q, to be reviewed at a future TAC meeting.

e) Winter Storage Technical Bulletin

Action: Ray will work with Phil Carroll on a technical bulletin. Target September.

f) Bolt & Nut Research

- Estimated material service life (Pete Ault quote)
- Higher abrasion resistant coatings (Leland lead)
- Dave to touch base with Byron to determine status of new coatings.

5. Ongoing Items

a) Kleskun Hills 5 Year Project

- August 10th report approved and submitted to Alberta Transportation
- Next site visit in August 2018

b) ASTM

May Spring meeting is in San Diego. CSPI will not be attending.

c) NCSPA

Annual meeting in April in Florida – will not be attending.

d) TRB

Kevin gave an update:

- Working with concrete and plastic to determine how structures are failing
- May be working with concrete on a research project – how to design resilient and sustainable structures

e) CSA G401

CSA G401 Revisions List

5.1.3 Helical Lockseam CSP – for 1.1 change the diameter to a range (100mm – 3600mm) and tables 10 and 11 to standard sizes.

5.1.3.8 Welding of Coil Ends – wording required to address the reference to CSA W59 and its reference to CSA W47.1 certification requirement.

6.1 Quality of Work – (f) refers to defective welds (as defined in CSA W59) – thus the reference back to butt welds. We need to define certified welding between CSP & SPCS.

6.2.1 Repair of damaged metallic coating – references CAN/CGSB-1.181 which was withdrawn in October 2011. The equivalent standard is ASTM A760 which references A780 for repair.

Table 1 Chemical Composition of Steel – exceeds AASHTO M218 total composition cannot exceed 0.70. S/B updated for compliance.

Table 18 Minimum Coupler Dimensions – breakout corrugated and semi-corrugated couplers (very confusing). Semi corrugated 600mm couplers – does anyone manufacture this in Canada? In addition, identify that 600mm diameter refers to 5 bolts (can be interpreted incorrectly).

Other:

1. AASHTO M218 lists mechanical requirements of coil prior to fabrication
 - Tensile – 310 MPa minimum
 - Yield – 230 MPa minimum
 - Elongation in 50mm – 20% minimumG401 does not have a mechanical properties requirement for CSP material.
2. Welded lockseams for the North – permafrost
3. Markings – on both sides / logos versus names?
4. Polymer Laminated Repair – Denso 35?
5. Bolts

- Mock up standard and send to committee for review – 3rd Q 2018
- Submit to CSA for costing & review

f) AREMA

In future, reach out to Mike McGough as Phil is no longer attending meetings.

g) CSCC (Canadian Steel Construction Council)

Michael Moores the chair of both CSCC & AISI is retiring in May 2018. CSPI sent their appreciation to Michael for his invaluable support to the association.

h) AISI 2018 Projects Approved

Notice was received in December.

1. Polymer Laminated Steel	10,000
2. CSA Certification Programs	10,000
3. University Outreach Program	5,000
4. Galvalume Project	5,000
5. Floodnet	1,000
6. Environmental product declaration	5,000
7. Life cycle comparison	3,000
Total	\$39,000

6. Discussion / New Business

No new business.

7. Adjourn & Next Meeting

The meeting was adjourned at **11:28am**. Next meeting will be at the call of the chair.

Secretary
Ray Wilcock