1) **Call to Order and Introductions** (Zwanka)

2) **Review of Current Technical Committee Members** (Zwanka)

<table>
<thead>
<tr>
<th>Name</th>
<th>Agency Name</th>
<th>Designation</th>
<th>Member Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zwanka, Merrill E</td>
<td>South Carolina Department of Transportation</td>
<td>Chair</td>
<td>Voting</td>
</tr>
<tr>
<td>Hughes, Scott Eric</td>
<td>Illinois Department of Transportation</td>
<td>Vice Chair</td>
<td>Voting</td>
</tr>
<tr>
<td>Pickett, William B.</td>
<td>Alabama Department of Transportation</td>
<td>Member</td>
<td>Non-Voting</td>
</tr>
<tr>
<td>Ingram, Steven</td>
<td>Alabama Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>San Angelo, Michael</td>
<td>Alaska Department of Transportation and Public Facilities</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Lukkarila, Paul Q.</td>
<td>California Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Pelham, Michael Paul</td>
<td>Indiana Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Khoda, Mahbub E</td>
<td>Iowa Department of Transportation</td>
<td>Member</td>
<td>Non-Voting</td>
</tr>
<tr>
<td>Meggers, Dave</td>
<td>Kansas Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Morris, Justin W</td>
<td>Louisiana Department of Transportation and Development</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Stilwell, Joseph</td>
<td>Maine Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Seward, Kenny R.</td>
<td>Oklahoma Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Janak, Karl J</td>
<td>Texas Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Shi, Bin</td>
<td>Utah Department of Transportation</td>
<td>Member</td>
<td>Voting</td>
</tr>
<tr>
<td>Halsted, Greg</td>
<td>Concrete Reinforcing Steel Institute</td>
<td>Other</td>
<td>Non-Voting</td>
</tr>
<tr>
<td>Wagner, Richard Thomas</td>
<td>Insteel Wire Products</td>
<td>Other</td>
<td>Non-Voting</td>
</tr>
<tr>
<td>Brasell, John P</td>
<td>Nucor Steel Connecticut, Inc.</td>
<td>Other</td>
<td>Non-Voting</td>
</tr>
</tbody>
</table>
3) **Brief summary of the technical committee** (for states who do not participate in quarterly calls or who are new to NTPEP) (Zwanka/Hughes) – Merrill presented the history.

4) **Review 2018 NTPEP ballot results for the RS work plan** – See below:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Individual Name</th>
<th>Item No. 4 - Please review the attached documents for REBAR and provide your vote and corresponding comments.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas Department of Transportation</td>
<td>Michael C Benson</td>
<td>Affirmative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 3.2 coordinate should be coordinates \</td>
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<tr>
<td></td>
<td></td>
<td>Section 3.11 Specification should be Specifications</td>
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<tr>
<td></td>
<td></td>
<td>Section 4.1 In the last sentence an &quot;a&quot; should be added after how and before product</td>
</tr>
<tr>
<td>Maryland Department of Transportation</td>
<td>Eric Dougherty</td>
<td>Affirmative W/Condition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See attached comments</td>
</tr>
<tr>
<td>Rhode Island Department of Transportation</td>
<td>Jose S Lima</td>
<td>No Vote</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 3.10 - &quot;Quality Assurance&quot; includes acceptance and independent testing which are not functions typically</td>
</tr>
<tr>
<td></td>
<td></td>
<td>performed by the Manufacturer. Recommend that the QMS refer only to Quality Control.</td>
</tr>
<tr>
<td>South Carolina Department of Transportation</td>
<td>Merrill E Zwanka</td>
<td>Affirmative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2 - Referenced Documents. None of these referenced documents are actually referenced. Add the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>appropriate AASHTO or ASTM designation to each of the tests listed in Sections 6.1.1.1 through 6.1.1.4.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2.1 - Delete M32, M55, M221, and M225 since they have all been discontinued.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 2.1 - Replace the four deleted standards with M336M/M336, Steel Wire and Welded Wire, Plain and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deformed, for Concrete Reinforcement.</td>
</tr>
<tr>
<td>Virginia Department of Transportation</td>
<td>William R Bailey</td>
<td>Affirmative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Title to Section 4 should be “QUALITY MANAGEMENT SYSTEM (QMS) REQUIREMENTS”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reference to additional requirements contained in another standard should be listed as a subsection of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Section 4 in order of importance.</td>
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<tr>
<td></td>
<td></td>
<td>Does the committee wish to consider Corrosion resistant steel - steel with less than 12% chromium? If so,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>then it could be included in Stainless category or an additional category could be developed exactly the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>same as stainless steel category.</td>
</tr>
</tbody>
</table>

Does the Committee want to consider incorporating corrosion resistant (CR) steel? **VA – we would like to include this. MT – wants CR as well. NC – What about GFRP?**
Merrill discussed how new product areas are added to the NTPEP programs based on NTPEP surveys of the states.

5) **AASHTO M336 update** (Zwanka) – M31 includes ASTM A615 & A706. **NOTE:** M 336 is the equivalent for A1064 and is an available specification starting in June 2018.

6) **Update-Program Status** (Fragapane)
   a) REBAR – 35 Mills in 2018
   b) WWR – 25 Mills in 2018
   c) First Wire Manufacturer audit – went fairly well for a first-time audit. Fairly typical

7) **New Products** (Fragapane)
   a) A1064 Wire – Two Mills participating in 2018
   b) Stainless Steel - No mills participating. One DOT is pressing their Mfgs. to get audited. A mill stated to CRSI that they are ready for an audit. MassDOT working on getting the requirement in their specs. This TC needs to get the word out to the states about this program.
   c) 7 Wire Strand - Program will open in 2019
      i) Mock audit Performed February 2018 (see below)

8) **7 Wire Strand Comparison Report** (Ed Hughes) – Ryan & Ed presented what happened on the first Informational Review (Mock Audit) for this product. It went well, gathered good information. Ed discussed the Comparison Report draft. What diameters do you want to have and test in the audit? 3/8”, 0.5”, 0.6”, 0.7” were mentioned. At issue is the jaw size needed for the grips to conduct testing for all sizes.

9) **Industry Concerns**
   a) Greg Halstead (CRSI) presented an Epoxy Coating Update presentation on the CRI Program and a survey of all CRSI Certified Plants regarding coating issues that prompted the Committee’s need for a NTPEP program. WI – had bending issues recently (*post coating bar failures*). Is “cost” an issue associated with this issue?
   b) Richard Wagner (WRI) – Industry is pleased with the NTPEP Program. Some concerns are:
i) **Cost increases** – NTPEP was a 0.5% increase the past year. When checking for other sources to provide testing, our current lab was the lowest cost.

ii) **Audit is a good place to verify Buy America. Could we use the audit as a place to verify Buy America?** – The purpose of the audit is to verify there is a traceability system in place and it is functional.

iii) **Concerns about Welded Reinforcement for Concrete Pipe** – Just want to keep it on the radar.

10) **Open Discussion**
   a) **CRSI** – Specifications and product performance for A615 & A706 are getting closer to being the same thing.
   b) Merrill encouraged states to have a representative accompany the auditors on facilities within their own state. Promotes shared knowledge.
Epoxy Coating Update

AASHTO 2018 NTPEP Annual Meeting
Norfolk, Virginia
April 24, 2018
Greg Halsted, P.E.

- Concrete Reinforcing Steel Institute
- Portland Cement Association
- Georgia Department of Transportation
ASTM A775 Epoxy Bar Use

- 2nd most common strategy to prevent reinforcement corrosion
  - following increased concrete cover

- 990,000,000 ft² of decks
  - over 82,800 bridges in the US alone
  - ~700,000 ton/year or ~10% of all rebar in North America
Chronology of ASTM A775

1981 - first version approved
1989 - permissible damage 1% (was 2%)
1989 - anchor profile introduced
1990 - all damage must be repaired
1993 - increased coating thickness
1994 - bend to 180 degree
1995 - reduced holidays, coating deficiency, time to coat
1997 - CD test, outdoor storage
2004 - increased coating thickness
2015 - English first, under ballot – reduced CD and inspection changes
2017 - CD test eliminated for manufacturing

The bars of 2018 are substantially improved.
Certification Program

• For fusion-bonded epoxy coating applicator plants
• Started in 1991
• Voluntary
• ANSI certified
• Third-party inspection
Overview

• The CRSI Program provides the means of ensuring that coating and fabrication plants have trained staff and are capable of producing quality epoxy-coated steel reinforcing bars in accordance with industry standards and recommendations.

• Program is open to all epoxy coaters and fabricators of epoxy-coated bars.

• Certification applies to plant and specific process, not company.
CRSI Epoxy Coating Plant Certification Program

The following plants meet quality criteria according to CRSI's Standard for Epoxy-Coating Plants:

(•) Straight Bar Lines (CG1.1 2016) and (✓) Custom Lines (CG1.2 2016)

**California**
- • Dayton Superior Corporation
- • Fletcher Coating Co.
- • JC Supply & Manufacturing Ontario

**Colorado**
- • CMC Rebar (CO)

**Illinois**
- • ABC Coating Company of Illinois
- • Harris Rebar Bourbonnais, 815-820-3770

**Mississippi**
- • Steel Specialties of Mississippi, Inc.

**New Jersey**
- • Gerbau

**New York**
- • Corrison Control, Inc.
- • Dimension Fabricators

**North Carolina**
- • CMC Rebar (NC)

**Ohio**
- • Simcora, Inc.

**Oklahoma**
- • ABC Coating Company of Oklahoma, Inc.

**Oregon**
- • Ferwest Steel Corporation Eugene, 503-269-8729

**Pennsylvania**
- • Harris Rebar Bethlehem, 610-882-1401

**Tennessee**
- • Gerbau Nashville, 615-645-1601

**Texas**
- • CMS Rebar (TX)

**Utah**
- • Western Coating, Inc.

**Washington**
- • Harris Rebar Inc.

**Wisconsin**
- • Aceltic

**Transportation Agencies that make reference to the CRSI Plant Certification Program**

- Arizona
- California
- Colorado
- Connecticut
- Delaware
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wyoming
- British Columbia
- Ontario

Certified Plants as of July, 2017
Program assesses the plant’s Quality Control inspectors and line staff
Program assesses the plant’s production equipment
Program assesses the plant’s Quality Control equipment
Program assesses the plant’s inspection records
Plant responsibility and quality standards

• It is the responsibility of the plant to ensure that ALL product meets the requirements of the purchaser’s specifications.

• Areas evaluated in the reinforcing bar coating process include:
  ◦ Quality Control policies and procedures
  ◦ handling and storage practices
  ◦ surface preparation
  ◦ curing
  ◦ holiday testing
  ◦ thickness measurement
  ◦ adhesion testing
General procedures

• A Plant Quality Manual (PQM) is developed stating what a plant will do to ensure and maintain quality.
  ◦ the PQM is developed for each plant by each plant
• This manual will be reviewed periodically for conformance to the CRSI standards.
  ◦ the PQM will be used during the inspection
• If a plant does not comply with its prepared PQM, then a deficiency will be noted.
• Plants are required to fix deficiencies.
• Failure to fix deficiencies leads to decertification.
NTPEP and CRSI

• The CRSI goal is to work with NTPEP to provide a program that meets both our requirements as well as those of the DOTs.

• CRSI became concerned when talk started in this Technical Committee back in 2013 about the need for additional epoxy coating thickness testing.

• “We are looking to supplement a typical CRSI audit with a comparison testing portion on randomly selected finished product.”

• CRSI and member coating plants unaware of any problems.
CRSI survey to coating plant members

• In February 2018, CRSI contacted all 37 of their certified epoxy coating producers to seek their support in gathering information pertaining to epoxy coating thickness of reinforcing bars and custom products.

• To evaluate any customer complaints from state DOTs to determine if they were having issues with non-compliant epoxy coating thicknesses.

• The information requested from these plants was as follows:
  o DOT inspection reports documenting non-conformance of coating thickness
  o DOT complaints related to epoxy coating thickness
  o for all product produced in 2016 and 2017
Survey results

- All 37 plants responded.
- These plants produce approximately 700,000 tons annually.
- ~95% of all epoxy-coated reinforcing steel used in the marketplace.
- Only 2 single occurrences of reported thickness non-conformances.
  - #4 bar - 0.3 mils over maximum specification of 12 mils
  - #3 bar - 0.5 to 1.1 mils over maximum specification of 12 mils
- Reflect a miniscule ~0.0006% of total production volume.
- Both satisfactorily and fully resolved between producer and the DOT.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>1980’s</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar anchor profile</td>
<td>-</td>
<td>1.5-4 mil</td>
</tr>
<tr>
<td>Coating delay after blasting</td>
<td>&lt; 8 hours</td>
<td>&lt; 3 hours</td>
</tr>
<tr>
<td>Coating thickness</td>
<td>90 percent within 5 +/-2 mil</td>
<td>7-12 mil (Nos. 3-5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7-16 mil (Nos. 6-18)</td>
</tr>
<tr>
<td>Coating continuity</td>
<td>&lt; 2 holidays per foot</td>
<td>&lt; 1 holiday per foot</td>
</tr>
<tr>
<td>Coating flexibility</td>
<td>120 degree bend</td>
<td>180 degree bend</td>
</tr>
<tr>
<td>Cathodic disbondment test</td>
<td>-</td>
<td>Yes*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 per 8 hours</td>
</tr>
</tbody>
</table>
Questions / Discussion

Gregory E. Halsted, P.E.
Western Region Manager
and Transportation Engineer
Concrete Reinforcing Steel Institute
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Bellingham, Washington 98226
(630) 380-5871
ghalsted@crsi.org