AGENDA

PTI M-50 / ASBI Bonded Tendon Task Group
Monday, October 19, 2020, 2:00 pm - 4:00 pm EDT
2020 PTI Virtual Convention

Voting Members Present (0 of 29; Quorum=12)
Bob Sward, Chair  Structural Technologies, Inc.
Gregg Freeby, Staff Liaison, NV  American Segmental Bridge Institute
Miroslav Vejvoda, Secretary, NV  Post-Tensioning Institute
Edgar Zuniga, TAB Contact, NV  Dywidag-Systems International USA, Inc.
Tommaso Ciccone  Tensacchiai Srl
Guy Cloutier  LCPT International Consulting, Inc.
Tom DeHaven  Figg Bridge Engineers
H.R. Hamilton  American Concrete Institute
Joe Harrison  Consultant
Reggie Holt  Federal Highway Administration
Elie Homsi  Parsons
Gregory Hunsicker  Onpoint Engineering and Technology, LLC
Larry Krauser  General Technologies, Inc.
Dave Martin  General Technologies, Inc.
Brian Merrill  Wiss, Janney, Elstner Associates, Inc.
Andrew Micklus  Freyssinet, Inc.
R. Kent Montgomery  Figg Bridge Engineers
Alan Moreton  Corven Engineering, Inc.
Jerry Pfunther  Finley Engineering Group
Jose Luis Quintana  Mexpresa
Greg Redmond  PT-Technologies, LLC
Robert Robertson, Jr.  Florida Department of Transportation
Ralph Salamie  Kiewit Infrastructure West
Joe Salvadori  Michael Baker International
Guido Schwager  Schwager Davis, Inc.
Mike Schwager  Schwager Davis, Inc.
Leo Spaans  Janssen & Spaans Engineering, Inc.
Michael Sprinkel  Virginia Transportation Research Council
Teddy Theryo  Florida Department of Transportation
Dustin Thomas  Minnesota Department of Transportation
Scott Turnpaugh  Traylor Bros., Inc.
Zuming Xia  Structural Technologies, Inc.

Associate Members Present
Yosbani Ballate  Structural Technologies, Inc.
Mike Beauchamp  Caltrans
Robert Bennett  Parsons
Hilliard Bond  Structural Technologies
John Crigler  NOVA
Thomas Helm  Dywidag-Systems International USA, Inc.
Shahid Islam  Washington State DOT
Bljan Khaleghi  Bekaert Corp
Dale King  Atkins Global
David Konz  WSP
Antonio Ledesma  Shimmick-Parsons
Shannon Meeks  General Technologies, Inc.
Theodore Neff  WJE
John Pearson
ACTION ITEMS FROM LAST / THIS MEETING

<table>
<thead>
<tr>
<th>Item #</th>
<th>Subject</th>
<th>Action</th>
<th>Responsible</th>
<th>Deadline / Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monitorable Tendons</td>
<td>Review proposed Specification and Commentary</td>
<td>TG: L Krauser; T Ciccone; R Holt; J Salvadori</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Replaceable Grouted Tendons w. Diabolos</td>
<td>Review proposed Specification and Commentary</td>
<td>TG: R Holt; M Schwager</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bulletin 7 vs. 75</td>
<td>Review Bulletin 7 vs. 75 or other plastic duct requirements</td>
<td>TG: L Krauser; R Sward; J Myer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loops &amp; Tangent Length</td>
<td>Draft Specification and Commentary language</td>
<td>TG: M Schwager; R Sward</td>
<td></td>
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</tbody>
</table>

**Agenda Item**

<table>
<thead>
<tr>
<th><strong>A. General</strong></th>
<th><strong>Expected Outcome / Actions Taken</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 Call to Order</td>
<td>A.1 Meeting called to order at 00:00 pm.</td>
</tr>
<tr>
<td>A.2 Introductions / Announcements</td>
<td>A.2 All present are asked to introduce themselves. Any announcements?</td>
</tr>
<tr>
<td>A.3 Committee Roster</td>
<td>A.3 The official committee roster is on the PTI website. Please notify staff of any changes.</td>
</tr>
<tr>
<td>A.4 PTI Antitrust Policy (Exhibit A.4)</td>
<td>A.4 All present are reminded of the PTI Antitrust Policy and asked to adhere to the policy.</td>
</tr>
<tr>
<td>A.5 Committee Annual Report</td>
<td>A.5 The Annual Report will be prepared after the meeting and submitted to TAB before the end of 2020.</td>
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**B. Agenda & Minutes**

<table>
<thead>
<tr>
<th><strong>B.1 Approval of Agenda</strong></th>
<th><strong>Expected Outcome / Actions Taken</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1 Any changes to the agenda?</td>
<td></td>
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<tr>
<td>Agenda Item</td>
<td>Expected Outcome / Actions Taken</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
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<tr>
<td>B.2.1 Meeting Minutes from November 3, 2019, <em>(Exhibit B.2.1)</em></td>
<td>B.2.1 Motion / Second to approve Meeting Minutes from 5/6/18: Name / Name, 0-0-0 (Y-N-A)</td>
</tr>
<tr>
<td>C. Actions Taken Between Meetings</td>
<td></td>
</tr>
<tr>
<td>C.1 Letter Ballot:</td>
<td></td>
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<tr>
<td>C.1.1 EIT</td>
<td></td>
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<tr>
<td>C.1.2 Replaceable Tendons</td>
<td></td>
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<tr>
<td>C.2 Web Meetings: None</td>
<td></td>
</tr>
<tr>
<td>P.1 Presentation: WJE Report on tendon failure and items for consideration and possible specification change</td>
<td>P.1 Presentation by John Pearson; Approx. 20 min.</td>
</tr>
<tr>
<td>1. Action Item 1: M50.3-XX</td>
<td></td>
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<tr>
<td>1.1 New business items from the last cycle.</td>
<td>1.1 <em>(Exhibit 1.1)</em></td>
</tr>
<tr>
<td>2. Action Item 2: Monitorable, Replaceable and Assessable PT Research Project</td>
<td></td>
</tr>
<tr>
<td>2.1 EIT (Monitorable tendons)</td>
<td>2.1 Status</td>
</tr>
<tr>
<td>TG: Larry Krauser, Tommaso Ciccone, Reggie Holt, Joe Salvadori</td>
<td>2.1.1 Report: Approx. 30 min.</td>
</tr>
<tr>
<td>2.1.1 Structural Technologies Report: Update on application of flexible filler on FLDOT projects:</td>
<td>2.2 Status</td>
</tr>
<tr>
<td>2.2 Replaceable Grouted Tendons including diabolos</td>
<td>2.2.1 Discussion</td>
</tr>
<tr>
<td>TG: Reggie Holt, Mike Schwager</td>
<td></td>
</tr>
<tr>
<td>2.2.1 Modify Replaceable Tendons language to address tendons with flexible filler</td>
<td></td>
</tr>
<tr>
<td>3. Action Item 3: Bulletin 7 vs. Bulletin 75 or other plastic duct requirements</td>
<td>4.1 Status</td>
</tr>
<tr>
<td>3.1 TG: Larry Krauser, Bob Sward, Jacob Myer</td>
<td>Discussion on which criteria to use, Bulletin 7 or 75?</td>
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<tr>
<td>Agenda Item</td>
<td>Expected Outcome / Actions Taken</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td><strong>4. Action Item 3: State of Acceptance of the M50.3 &amp; M55.1 Specifications</strong></td>
<td>4. Discussion on what can be done to increase their adoption by Owners and Engineers. What are the reservations with adopting the specification?</td>
</tr>
<tr>
<td><strong>5. Action Item 5: Stainless Steel Strand</strong></td>
<td>5. Reid Castrodale is on the NCHRP 12-120 team that is just beginning to work on developing guidelines and specifications for design and construction using stainless steel strands. Where is stainless steel strand used and are there sample specifications?</td>
</tr>
<tr>
<td><strong>6. Action Item 6: PT Systems Qualification Testing</strong></td>
<td>6.1 Progress report from CRT-70 (Chair Hunsicker)</td>
</tr>
<tr>
<td>7.2 AASHTO Updates TG: Merrill, Cloutier, Krauser, Cox, Hunsicker</td>
<td>7.1 Update</td>
</tr>
<tr>
<td><strong>8. Action Item 8: Loops &amp; Tangent Length</strong></td>
<td>8.1 TG: M Schwager, R Sward</td>
</tr>
<tr>
<td><strong>D. New Business</strong></td>
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<tr>
<td>D.1 Duct spacing and stacking</td>
<td>D.1 What should be the minimum duct spacing? Should bundled be permitted and under what circumstances? Similar questions evolved recently (Exhibit D.1). Discussion:</td>
</tr>
<tr>
<td>D.2 Any other new items?</td>
<td></td>
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<tr>
<td><strong>E. Next Meeting</strong></td>
<td></td>
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<tr>
<td>E.1 2021 PTI Convention, Indianapolis IN, April 18-21, 2021</td>
<td>E.1 Westin Indianapolis; exact day and time will be announced when known.</td>
</tr>
<tr>
<td>E.2 Web Meetings</td>
<td>E.2 As needed</td>
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<tr>
<td><strong>F. Adjourn</strong></td>
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<tr>
<td></td>
<td>F. Meeting adjourned at 00:00 pm.</td>
</tr>
<tr>
<td>Exhibit #</td>
<td>Subject</td>
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<td>--------------------------------------------------------------</td>
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<tr>
<td>A.4</td>
<td>PTI Antitrust Policy</td>
</tr>
<tr>
<td>B.2.1</td>
<td>Meeting Minutes from 11/3/19 – Orlando</td>
</tr>
<tr>
<td>1.1</td>
<td>New business items from last cycle</td>
</tr>
<tr>
<td>8.1</td>
<td>Loops &amp; Tangent Lengths – Draft Specification and Commentary language</td>
</tr>
<tr>
<td>D.1</td>
<td>Duct Spacing Questions</td>
</tr>
</tbody>
</table>
At a meeting on October 8, 1980, the Board of Directors first discussed the Institute's status and policies regarding compliance with antitrust laws. After review of both the internal and external compliance procedures, the following resolution was approved:

"The staff, officers, directors and members of the Post-Tensioning Institute are reminded that they are required to comply with the spirit and specific requirements of the antitrust laws on all activities within the scope of, and related to, the official functions of PTI. Further, this restated position, along with appropriate explanatory material, should be placed in all meeting folders/books periodically, beginning with the 8th of October meeting of PTI."

On July 24, 2012 and again on October 7, 2015, the Executive Committee authorized Legal Counsel to review and update this Policy Statement in the perspective of the Department of Justice Business Review Letter of July 30, 1997 and current case law. As a continuing guide for your participation in PTI's meetings, please review and continue to adhere to the following "Legal Limitation on Discussions at PTI Meetings."

**LEGAL LIMITATION ON DISCUSSIONS AT PTI MEETINGS AND EVENTS**

A free exchange of ideas on matters of mutual interest to the members is necessary for the success of all meetings. Indeed, such an exchange of views is essential to the successful operation of every trade association and the law specifically allows legitimate exchange of views pertaining to, e.g., quality control, safety, building design and construction integrity, etc.

It is not the purpose of this memorandum to discourage the exploration in depth of any matters of legitimate concern to meeting participants. Nevertheless, to ignore certain antitrust ground rules, either through ignorance or otherwise, is to create a civil and criminal hazard businessmen simply cannot afford.

It is for these reasons that PTI provides you with a reminder that certain areas of formal and informal communication between competitors or between manufacturers and their suppliers and customers must be avoided, as posing potential antitrust problems.

The Sherman Antitrust Act, the Clayton Act, the Federal Trade Commission Act, and the Robinson-Patman Act comprise the basic federal antitrust laws, which set forth the broad areas of conduct considered illegal as restraints of trade. In general, agreements or understandings between competitors that operate as an impediment to free and open competition are forbidden. Federal antitrust prohibitions forbid any "agreement or understanding...to substantially lessen competition or tend to create a monopoly in any line of commerce." An important point to keep in mind is that communications and discussions between competitors or between sellers and customers, about matters which may be considered anti-competitive, often comprise the evidence from which courts infer antitrust violations. It is the policy of the Post-Tensioning Institute that such agreements, understandings or communications shall not be tolerated at any formal or informal meetings or social events of the Institute.

The general prohibitions contained in the federal antitrust laws, have been particularized in the form of a series of consent decrees, originally entered against a number of member companies of various trade associations and the associations themselves. It is important to note that these laws not only apply to PTI members, but also to PTI itself. Often trade associations have been and are presently co-defendants in cases brought by the Justice Department and the Federal Trade Commission (“FTC”). Recently, the FTC has stated: “Because trade associations are by their nature collaborations among competitors, the Commission and courts have long been concerned with anti-competitive restraints imposed by such organizations under the guise of codes of conduct. Competing for customers, cutting prices, and recruiting employees are hallmarks of vigorous competition. Agreements among competitors not to engage in these activities injure consumers by increasing prices and reducing quality and choice.” Similar “codes” or policies and requirements that encourage directly or indirectly members’ unlawful activity are strictly forbidden by PTI in the course of its business with its members.
SPECIFIC EXAMPLES OF ACTIVITIES AND PRACTICES PROHIBITED
AT ALL PTI MEETINGS AND EVENTS:

Included in activities and practices which are forbidden, and are contrary to the policy of the Institute, both under the general antitrust laws and the consent decrees, subject to the said Business Review Letter, are the following:

- Agreeing to allocate markets, customers or suppliers among competitors, classify certain customers or suppliers being entitled to preferential treatment by manufacturers, and establish geographic trading areas.

- Participating in any plan designed to induce any manufacturer or distributor to sell or refrain from selling, or discriminate in favor of, or against any particular customer or class of customers.

- Agreeing in any manner to fix or otherwise establish bids, prices (including price increases, decreases, standardization or stabilization), profits, costs, contract terms affecting price (such as discounts and credit terms), etc. because, e.g. prices were too low, with the exception of certain resale pricing agreements between manufacturers and retailers or distributors.

- Agreeing in any manner to limit or restrict the quality of products to be produced (e.g., restrictions on selling coated strand to certain customers).

- Participating in any plan which has the effect of discriminating against, or excluding competitors, suppliers or customers.

These examples are provided to guide you in your discussions during formal and informal PTI meetings and social events. If the occasion arises, more specific advice will be provided by legal counsel, who is required by Article IV, Section 7 of the PTI By-Laws to be present at all meetings of the Board of Directors and the Executive Committee.
# PTI M-50 / ASBI Multistrand and Grouted Tendon Joint Task Group

**Sunday, November 3, 2019, 1:00 PM to 5:00 PM**

Disney’s Contemporary Resort, Orlando FL, Room Fantasia K-L

<table>
<thead>
<tr>
<th>Voting Members Present (x of 30; Quorum = 12)</th>
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<tbody>
<tr>
<td>Bob Sward, Chair Structural Technologies, Inc.</td>
</tr>
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<td>Gregg Freeby, Staff Liaison, NV ASBI</td>
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<td>Miroslav Vejvoda, Secretary, NV Post-Tensioning Institute</td>
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<td>Edgar Zuniga, TAB Contact, NV Dywidag-Systems International USA, Inc.</td>
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<td>Tom DeHaven Figg Bridge Engineers</td>
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<tr>
<td>Trey Hamilton University of Florida</td>
</tr>
<tr>
<td>Joe Harrison Consultant</td>
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<tr>
<td>Reggie Holt Federal Highway Administration</td>
</tr>
<tr>
<td>Elie Homsi Parsons</td>
</tr>
</tbody>
</table>
Associate Members Present

Yosbany Ballate
Structural Technologies, LLC/VSL

Mike Beauchamp
Caltrans

Robert Bennett
RSH

Hilliard C Bond
Parsons

John Crigler
Structural Technologies VSL

Thomas Helm
Nova Geotechnical and Inspection Services

Shahid Islam

Dywidag Systems International

Bijan Khaleghi
Washington State DOT

Dale King
Bekaert Corp

David Konz
Atkins Global

Antonio L Ledesma
WSP USA

Shannon Meeks
Parsons

Theodore L Neff
General Technologies, Inc.

John Pearson
WJE

Marcel Poser
Tectus Group

Mario Salice
Schwager Davis, Inc.

Don Singer
Dywidag-Systems International Canada Ltd.

Eric Sommer
Structural Group

Jack Torok
Target Products Quikrete

Visitors Present
## Agenda Item

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<tr>
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## Expected Outcome / Actions Taken

<table>
<thead>
<tr>
<th>Agenda Item</th>
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<tbody>
<tr>
<td><strong>A. General</strong></td>
<td></td>
</tr>
<tr>
<td>A.1 Call to Order</td>
<td>A.1 Meeting was called to order at 1:10 pm.</td>
</tr>
<tr>
<td>A.2 Introductions</td>
<td>A.2 All were asked to introduce themselves and to sign the Attendance Sheet.</td>
</tr>
<tr>
<td>A.3 Committee Roster / Changes</td>
<td>A.3 The official TAB roster is on the PTI website. Members were asked to review the roster and report to staff any changes.</td>
</tr>
<tr>
<td>A.4 PTI Antitrust Policy</td>
<td>A.4 All present were reminded of the PTI Antitrust Policy and asked to initial the right column of the Attendance Sheet to attest knowledge of and compliance with the policy.</td>
</tr>
<tr>
<td>A.5 Annual Report</td>
<td>A.5 The Annual Report, distributed before the meeting, will be reviewed and finalized. It should be sent to TAB after the meeting. Are there any other goals? Add flexible filler.</td>
</tr>
<tr>
<td></td>
<td>A.6 Published spec; congratulations to Co-Chairs and Committee.</td>
</tr>
<tr>
<td><strong>B. Agenda &amp; Minutes</strong></td>
<td></td>
</tr>
<tr>
<td>B.1 Approval of Agenda</td>
<td>B.1 Any changes to the agenda? No changes were proposed.</td>
</tr>
<tr>
<td>B.2 Approval of Minutes from 11/4/2018 (Meeting ballot required); M-50 Website</td>
<td>B.2 Motion / Second to approve Meeting Minutes from 11/4/18: Krauser / Merrill, 13-0-0 (Y-N-A)</td>
</tr>
<tr>
<td>B.2 Approval of Minutes from 5/5/2019 (Meeting ballot required); M-50 Website</td>
<td>B.3 Motion / Second to approve Meeting Minutes from 5/5/19: Krauser / Merrill, 13-0-0 (Y-N-A)</td>
</tr>
<tr>
<td><strong>C. Actions Taken Between Meetings</strong></td>
<td></td>
</tr>
<tr>
<td>C.1 Letter Ballots (none)</td>
<td>C.1</td>
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<tr>
<td>C.2 Web Meetings (none)</td>
<td>C.2</td>
</tr>
<tr>
<td>Agenda Item</td>
<td>Expected Outcome / Actions Taken</td>
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</tr>
<tr>
<td><strong>1. Action Item 1: (Electrically Isolated Tendons (EIT))</strong>&lt;br&gt;1.1 FHWA Draft – Monitorable Tendons</td>
<td>1.2 FHWA Draft is at M-50 website – Draft Documents (it was distributed in the past). A TG with Larry, Tommaso, Reggie, and Joe Salvadori will review it first. It will then be sent to a 30-day review ballot; after the feedback is discussed and incorporated, it will then be followed by a full ballot. For the full ballot, the proposed language will be included in M50.3 at locations where the different parts belong.</td>
</tr>
<tr>
<td>1.2 Report on EIT Study Group to Italy and Switzerland; follow up</td>
<td>1.2 Reggie Holt gave an overview of the EIT Study trip to Europe.</td>
</tr>
<tr>
<td>1.3 Follow-up Meeting at the PTI Convention in Miami, May 3-6, 2020, Hilton Miami Downtown</td>
<td>1.3 On Saturday before the PTI Convention in Miami, there will be presentations and discussion on the EIT; the final report from the EIT Study Group will follow and include any conclusions from the follow-up meeting.</td>
</tr>
<tr>
<td>1.4 FHWA Draft Review</td>
<td>1.4 It is anticipated that the review ballot will start before the end of 2019.</td>
</tr>
<tr>
<td>1.5 EIT Specification Ballot</td>
<td>1.5 The proposed specification language will be balloted when the input from review ballot and the EIT Study group is reviewed and incorporated.</td>
</tr>
<tr>
<td><strong>2. Action Item 2: (Replaceable Tendons)</strong>&lt;br&gt;2.1. FHWA Draft – Replaceable Tendons</td>
<td>2.1 FHWA Draft is at M-50 website – Draft Documents (it was distributed in the past). Like the EIT document, the Replaceable Tendons document will be first reviewed by a TG with Reggie and Mike Schwager first. It will then be sent to a 30-day review ballot; after the feedback is discussed and incorporated, it will then be followed by a full ballot. For the full ballot, the proposed language will be included in M50.3 at locations where the different parts belong.</td>
</tr>
<tr>
<td>2.2 Report on the FHWA Draft</td>
<td>2.2 Reggie Holt gave an overview of the two documents that were commissioned by FHWA.</td>
</tr>
<tr>
<td>2.3 FHWA Draft Review</td>
<td>2.3 It is anticipated that the review ballot will start before the end of 2019.</td>
</tr>
<tr>
<td>Agenda Item</td>
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</tr>
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<tr>
<td>2.4 Replaceable Tendon Specification Ballot</td>
<td>2.4 The proposed specification language will be balloted when the input from review ballot is reviewed and incorporated.</td>
</tr>
<tr>
<td>3.1 TG Report</td>
<td>3.1 TG members Larry, Jacob, and Bob reported:</td>
</tr>
<tr>
<td>3.2 Draft language</td>
<td>• FL uses almost entirely bulletin 75; there some differences between the fib bulletin and the FDOT specification.</td>
</tr>
<tr>
<td>3.3 Draft review</td>
<td>• The qualification tests required for FL have already been done by most suppliers. There are some discrepancies as the FL specification keeps changing.</td>
</tr>
<tr>
<td>3.4 Ballot</td>
<td>• PTI only specifies the performance tests from bulletin 7; that could be the same from bulletin 75. It is not necessarily to include the entire specification. It might be better to rewrite the necessary section in M50.3 instead of referencing it. PT suppliers supplying internationally are already using bulletin 75. The question is if it makes sense to specify something less in M50.3.</td>
</tr>
<tr>
<td>3.4 Ballot</td>
<td>• FL has more testing requirements than bulletin 75. Ted is chair of the fib commission and can take proposed changes to bulletin 75 to fib.</td>
</tr>
<tr>
<td>3.4 Ballot</td>
<td>• Are there different criteria for hot wax? Criteria for smooth duct for external tendons are different from corrugated duct. What should be used, bulletin 7 or 75? Is it necessary to test all sizes? For the bond test, one can choose size, small, medium, or full size. But it is difficult to track changing criteria and remain consistent with both fib and FDOT. The TG will have recommendations on how to proceed.</td>
</tr>
<tr>
<td>3.4 Ballot</td>
<td>• Flexible filler was used so far on a few DOT jobs and on some small projects outside of DOTs.</td>
</tr>
<tr>
<td><strong>4. Action Item 4: Flexible Filler</strong></td>
<td>4.1 Joint TG M50-M-55: Bennett, Brinkus, Zuming, Tommaso, Don Singer, Gregg F. Start with a white paper; VSL did 2 jobs; went well; no issues; 2 operations with injection</td>
</tr>
<tr>
<td><strong>5. CRT-70, PTS Testing and Certification</strong></td>
<td>5.1 Greg reported that there will be a 30-day review followed up by a full ballot for the Organizational manual. It is desirable to publish and launch the program as soon as possible. The slides on inspection results, putting the issues with grouting in perspective, were published in ASPIRE Magazine.</td>
</tr>
<tr>
<td><strong>E. New Business</strong></td>
<td>E.1 The inspector training &amp; certification requirement should be included in the M50.3 specification.</td>
</tr>
<tr>
<td>Agenda Item</td>
<td>Expected Outcome / Actions Taken</td>
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<td>-------------------------------------</td>
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<tr>
<td>Training &amp; Certification</td>
<td>During the promotion of M50.3 and M55.1; it should also be address to DOTs and designers; they might be using their own specs, old specs, etc.</td>
</tr>
<tr>
<td>E.2 New Business</td>
<td>E.2 A webinar on the subject with PDH’s would be helpful.</td>
</tr>
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<td></td>
<td>E.2 Any other new business items?</td>
</tr>
<tr>
<td>F. Next Meeting</td>
<td>F.1 The exact day and time will be announced when available.</td>
</tr>
<tr>
<td>F.1 PTI Convention in Miami, May 3-6, 2020, Hilton Miami Downtown</td>
<td></td>
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<tr>
<td>F.2 Web Meetings</td>
<td>F.2 Web meetings:</td>
</tr>
<tr>
<td>G. Adjourn</td>
<td>G. The meeting was adjourned at 2:30 pm.</td>
</tr>
</tbody>
</table>

**AGENDA / MEETING EXHIBITS**

<table>
<thead>
<tr>
<th>Exhibit #</th>
<th>Subject</th>
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M-50 New Business Items

- Section 2.1: Specification calls out anchor nuts, but not hex nuts; both types should be identified.

- Section 4.3.5.2 & C4.3.5.2: Page 29, table 4.1: the decimal number of figures is not consistent.

- Section 4.4.3: Duct testing: The stiffness test requirements for duct connections are not specified; add the requirements for stiffness test.
4.3. # Dead-End Loop Anchorages

Loop anchorages shall consist of either; bent steel pipes, round or rectangular tubing, smooth walled HDPE pipe, corrugated HDPE Duct or watertight fabricated steel shapes.

The inner geometry of the loop anchorage maybe round, “D” shaped or rectangular and shall be dimensioned to limit the number of strand layers to three (3).

The minimum wall thickness for smooth HDPE pipe or corrugated HDPE plastic duct shall meet the requirements of section 4.4.4 for “Wear Resistance” and “Modified Wear Resistance”

The minimum inside radius of the loop anchorage shall be:

<table>
<thead>
<tr>
<th>No. of Strands</th>
<th>Min. Radius &quot;R&quot; (ft)</th>
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<tbody>
<tr>
<td>12</td>
<td>2.50</td>
</tr>
<tr>
<td>19</td>
<td>3.00</td>
</tr>
<tr>
<td>22</td>
<td>3.50</td>
</tr>
<tr>
<td>27</td>
<td>5.00</td>
</tr>
<tr>
<td>31</td>
<td>5.00</td>
</tr>
</tbody>
</table>

Tighter radii maybe used provided they are proven through testing per 4.4.1 where the loop anchorage shall develop at least 95% AUTS of the prestressing steel in an unbonded state.

Loops shall be formed in a manner that prevents kinks or crushing of the loop or cross section.

Transition from the loop anchorage to the tendon duct shall be detailed considering the direction of strand installation and to ensure duct and/or loop sheathing are not damaged during strand installation. Transitions shall be sealed consistent with the designated Protection Level (PL-#).

The Loop Anchorages shall be simultaneously stressed at the live ends to minimize movement of the strand through the loop during stressing.

Grout vents and drains shall be provided and positioned to allow for draining of the loop and proper grouting of the tendon. Grout vents shall be place opposite the bearing surface of the loop anchorage. Redundant grout vents are recommended. It is recommended to use ridged pipe for vertical loop anchorages

For loops consisting of round cross section, local zone reinforcing shall be designed and provided as part of the loop anchorage as shown below.

Minimum concrete clear cover to loop anchorages shall be 1 duct diameter/cross section width

At intermediate loop anchorages provided additional hairpins to tieback 25% of the loop force.
This is something we’ll want to make sure is addressed in the manual or the “best detail practices” – it will be an agenda item this coming meeting.

Brian D. Merrill, P.E.
Principal

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After requesting some additional information from the inquirer, I received this response which appears to close the matter.

Tim,

Thank you for the response.

Our Quality Control Team pressed for the bundled ducts to be separated by 1.5” clear to allow for concrete to drop between the PT Ducts and provide a better product eliminating our concern of the PT Tendons breaking through the adjacent duct during the Stressing Operation. The EOR concurred.

We have since poured this area and will go forward in the other areas with a similar design to have the separation between the horizontally bundled ducts.

Cheers.

Thank you,
From: Salvadori, Joe <Joe.Salvadori@mbakerintl.com>
Sent: Thursday, October 8, 2020 8:34 AM
To: Merrill, Brian <BMerrill@wje.com>; White, Christopher <chris.white@volkert.com>; dlnegrllc@gmail.com; scott.phelan@deainc.com; tony.ledesma@wsp.com; chris.erb@wsp.com; akeaschall@benesch.com; lspaans@jsengr.com
Cc: Tim D. Christle <Tim.Christle@post-tensioning.org>; Miroslav F. Vejvoda <Miroslav.Vejvoda@post-tensioning.org>
Subject: RE: EXTERNAL: RE: Duct Placement Question - Immediate response requested

“Bundled horizontal ducts in the center web”.... for clarity I have to ask – are these bundled tendons profiled? I feel “horizontal” means they are tangent but wanted to be sure.

Specific details would be most ideal.

joe

From: Merrill, Brian <BMerrill@wje.com>
Sent: Thursday, October 8, 2020 9:16 AM
To: White, Christopher <chris.white@volkert.com>; Salvadori, Joe <Joe.Salvadori@mbakerintl.com>; dlnegrllc@gmail.com; scott.phelan@deainc.com; tony.ledesma@wsp.com; chris.erb@wsp.com; akeaschall@benesch.com; lspaans@jsengr.com
Cc: TIM.CHRISTLE@POST-TENSIONING.ORG; miroslav.vejvoda@post-tensioning.org
Subject: EXTERNAL: RE: Duct Placement Question - Immediate response requested

I did not get a figure that indicated the condition he described. The figure they attached did not make sense to me.

Brian D. Merrill, P.E.
Principal

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www.wje.com
bmerrill@wje.com

From: White, Christopher <chris.white@volkert.com>
Sent: Thursday, October 8, 2020 8:15 AM
To: Merrill, Brian <BMerrill@wje.com>; joe.salvadori@mbakerintl.com; dlnegrllc@gmail.com
Scott Phelan; Tony Ledesma; Chris Erb; Akeaschall; Lspaans; TIM.CHristle@Post-Tensioning.org; Miroslav.Vejvoda@Post-Tensioning.org

Subject: RE: Duct Placement Question - Immediate response requested

Brian:

Did they attach Detail C that is referenced? I am having trouble visualizing this based on the discussion of “bundled set of 3 ducts” and reference to the “top two ducts” and “bottom two ducts.”

Christopher D. White, P.E.
Senior Bridge Engineer
Volkert, Inc.
12777 Jones Rd., Suite 355
Houston, TX 77070
Ph. (281) 466-2813
Cell (936) 777-0610

PTI received the following inquiry thru their website regard tendon placement in the web of a CIP PT Box girder.

We are having a concern in the construction of our box girder. Specifically, we have bundled horizontal ducts in the center web of the box girder typical flare section detail C. Current design has these ducts touching each other with 0? clear distance between the ducts. The shop drawing shows this and was approved by the EOR.
Our design team has stipulated that this design is acceptable per code:

* Horizontally bundled ducts are not a good idea with respect to construction quality, but they are acceptable per code.

  - **IF** a horizontal gap is included between adjacent ducts then it shall be 1.5? minimum per AASHTO LRFD 5.10.3.3.2

This is presenting our Quality Team with a conundrum. It is my concern that the top two bundled ducts without a clear separation will cause nesting in the ?V? section created by the ducts and will not allow quality consolidation at the lower two sets of horizontally bundled ducts with the same configuration.

There will be no way to get a vibrator in between the ducts, nor in between the first and third ducts, once the formwork is in place and I fear, we may have honeycombing and voids. ACI 318-11 section 7.6.7.2 states **“Bundling of post-tensioning ducts shall be permitted if shown that concrete can be satisfactorily placed and if provision is made to prevent the pre-stressing steel, when tensioned, from breaking through the duct.”**

This is my concern. Caltrans Standard B8-5 Clearance Requirements for Ducts Detail 5-4 gives some examples of the situation, but ours is unique with the bundled set of 3 ducts in the girder flare section.

Our construction team has given us a new mix design using ?? aggregate with an 8? slump.

Can you provide some technical advice on how my team should proceed in this example?

If you have any thoughts on this situation please respond to me and I'll compile the PTI response. The attached figure was included in the email but does not appear to reflect the conditions described. I've attached the referenced Caltrans standard as well.