MINUTES

PTI M-55 Grouting Committee
Sunday, November 4, 2018, 1:00 – 5:00 PM
Loews Chicago O’Hare Hotel, Chicago IL, Room Warhol

Voting Members Present (9 of 19; Quorum=8)

Greg Hunsicker, Chair
Andrea Schokker, TAB Contact
Miroslav Vejvoda, Secretary, NV
Gordon Clark
Guy Cloutier
Randy Cox
John Crigler
H.R. Hamilton
Reggie Holt
Bryan Lampe
Ivan Lasa
Brian Merrill
Andrew Micklus, Jr
Alan Moreton
Randall Poston
Greg Redmond
Mario Salice
Michael Sprinkel
Jack Torok

Precision-Hayes International
University of Minnesota Duluth
PTI
Ramboll
LCPT International Consulting, Inc.
American Segmental Bridge Institute
VSL
University of Florida
Federal Highway Administration Office of Bridge Technology
Dywidag-Systems International USA, Inc.
Florida Department of Transportation
Wiss, Janney, Elstner Associates, Inc.
Freyssinet, Inc.
Corven Engineering, Inc.
Pivot Engineers
PT-Technologies
Schwager Davis
Virginia Transportation Research Council
Target Products Ltd./Quikrete N.A.

Associate Members Present

Robert Bennett
Nagarajkumar Bommakanti
Julio Diamante
Chris Erb
Stephane Gonichon
Liao Haixue
Paul Kelley
Kingsley Lau
Shannon Meeks
Sharath Murthy
Eric Musselman
Jacob Myer
Nandish Pethani
José Luis Quintana
Aamer Syed
Teddy Theryo
Jeffrey West
Peter Yen
Zuming Xia

RS&H, Inc.
Span Systems International Co
AECOM
WSP
Eqiom
Vector Corrosion Technologies
Simpson Gumpertz & Heger
Florida International University
Parsons
Structural Technologies/VSL
Villanova University
Schwager Davis, Inc.
Nektor Engineers PT
Mexpression
Sika Corporation
Florida Department of Transportation
University of Waterloo
Bechtel National
VSL
Visitors
Mike Schwager, SDI
Keith McKenna, SDI
Hilliard C. Bond, Parsons
Natassia Brenkus, Ohio State
Walter Hanford, Euclid Chem
William Nickas, PCI
Matthew Baker, Precision-Hayes
Paul Hohensee, Precision-Hayes
Tom Helm, Nova
Alex Gutsch, MPA BS
Gregg Freeby, ASBI
Bob Sward, Structural Technologies
Ivica Zivanovic, Freyssinet

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>1.3.3</td>
<td>References</td>
<td>Review / update Referenced Standards and Specifications / References</td>
<td>RG: Schokker, Lasa, Lau</td>
<td>5-15-18</td>
</tr>
<tr>
<td>1.3</td>
<td>Specification to TAB Review</td>
<td>Send Specification to TAB Review</td>
<td>Staff</td>
<td>Asap</td>
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Agenda Item | Expected Outcome / Actions Taken
---|---
A. General
A.1 Call to Order | A.1 The meeting called to order by Chair at 1:05 pm.
A.2 Introductions / Attendance Sheet | A.2 All present are asked to introduce themselves and sign the Attendance Sheet.
A.3 Committee Roster | A.3 The official committee roster is on the PTI website. A copy of the roster is circulated for members to review their contact information.
A.4 PTI Antitrust Policy (Exhibit A.4) | A.4 All present are reminded of the PTI Antitrust Policy and asked to initial the right-hand side column on the Attendance Sheet to confirm their knowledge of and adherence to the policy.

B. Agenda & Minutes
B.1 Approval of Agenda | B.1 Any changes to the agenda?
<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Expected Outcome / Actions Taken</th>
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<tbody>
<tr>
<td>B.2.1 Meeting Minutes from May 7, 2018, distributed on May 15, 2018</td>
<td>B.2.1 Motion / Second, to approve Meeting Minutes from 5/7/18: Lasa / Merrill, 9-0-0 (Y-N-A)</td>
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<tr>
<td>C. Actions Taken Between Meetings</td>
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<tr>
<td>C.1 Letter Ballots: None</td>
<td>C.1</td>
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<td>C.2 Web Meetings: None</td>
<td>C.2</td>
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<td>1. Action Item 1: M55.1-XX</td>
<td>1.1 Document went to TAB review. It was approved with no comments.</td>
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<tr>
<td>1.1 Status of Specification</td>
<td>1.2 The updated references were attached (Exhibit 1.2 of the agenda).</td>
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<tr>
<td>1.2 References</td>
<td>1.3 After the references ballot, the document can move to the 45-day public review.</td>
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<td>1.3 Time table to completion</td>
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<td>2. Action Item 2: Grout Research</td>
<td>2.1 General discussion evolved Information about proper grouting to be disseminated:</td>
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<tr>
<td>2.1 Quality Control of Cements for Grouting of PT Tendons</td>
<td>• Grouting webinar • Gregg Reese, Modjeski and Masters, Inc., TG to prepare presentations to counter negative publicity about grouting • Monitoring, nondestructive testing, inspectability, etc. • Summarize ongoing research</td>
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<td>Promotion of M55.1 (and M50.3) needed to broaden use:</td>
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<td>• To consultants (using DOT specs) • PTI article in journals • Convention session presentations • T10 presentation • PTS suppliers to monitor specs and PTI can target those designers, DOTs, etc.</td>
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<td>D. New Business</td>
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<td>D.1 Performance specification</td>
<td>D.1</td>
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<td>D.2 Any other items for the next edition of the specification?</td>
<td>D.2</td>
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<td>E. Next Meeting</td>
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<td>E.1 PTI Convention</td>
<td>E.1 Sunday, May 5, 2019, at the Hyatt Regency Seattle, 808 Howell Street, Seattle, Washington. The time will be announced when the convention schedule is finalized.</td>
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<td>Agenda Item</td>
<td>Expected Outcome / Actions Taken</td>
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<td>E.2 Web Meetings</td>
<td>E.2 Web Meetings will be scheduled as needed.</td>
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<td>F. Adjourn</td>
<td>F. Meeting adjourned at 4:30 pm.</td>
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**AGENDA / MINUTES EXHIBITS**

<table>
<thead>
<tr>
<th>Exhibit #</th>
<th>Subject</th>
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<tbody>
<tr>
<td>A.4</td>
<td>PTI Anti-Trust Policy</td>
</tr>
<tr>
<td>1.2</td>
<td>Updated References</td>
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</tbody>
</table>
**Committee Attendance Sheet**

**Committee:** M-55 Grouting Committee  
**Date:** November 4, 2018  
**Meeting Location:** Loews Chicago O’Hare Hotel, Chicago IL

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* I have read, understand, and agree to comply with PTI Anti-Trust Policy (See reverse).

**Note to Committee Members and Visitors:** All Committee meetings of the Post-Tensioning Institute should be conducted in a manner encouraging free and open discussion and debate of agenda items and matter properly before that Committee. Committee members and visitors are cautioned that such discussion and debate is solely for the purposes of the Charter of the Committee and PTI business. To that end, Committee discussions and debates are not considered public in nature, and, as such are to be held in confidence and do not become the official policy of PTI until properly reported, balloted, and published pursuant to procedures established by or by the adoption by the PTI Board of Directors. Committee members and visitors shall not quote, publish, use, or make use of, any oral or written drafts, drawings, calculations, or other materials, which are uttered or transcribed during the course of such meetings.

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<tbody>
<tr>
<td>1</td>
<td>Mario Salicce</td>
<td>SDI</td>
<td>V</td>
<td><a href="mailto:mstulie@schwyzerdavis.com">mstulie@schwyzerdavis.com</a></td>
<td>MS</td>
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<tr>
<td>2</td>
<td>Mike Schwertter</td>
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<td><a href="mailto:mike@schwyzerdavis.com">mike@schwyzerdavis.com</a></td>
<td>KS</td>
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<tr>
<td>3</td>
<td>Keith McElnea</td>
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<td>Fom</td>
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<tr>
<td>8</td>
<td>Ivan R. Lasa</td>
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<td>V</td>
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<td>DGS</td>
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<td>9</td>
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<td>Guy Closter</td>
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<tr>
<td>11</td>
<td>Miroslav Vetschova</td>
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<td>12</td>
<td>William Nickas</td>
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<td>Brian Meehnen</td>
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<td><a href="mailto:bmeehnen@wje.com">bmeehnen@wje.com</a></td>
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<td>14</td>
<td>Matthew Balkic</td>
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<td>G</td>
<td><a href="mailto:matthew.balkic@actuant.com">matthew.balkic@actuant.com</a></td>
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<tr>
<td>15</td>
<td>Paul Hodmensee</td>
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<td>16</td>
<td>Brian Lampe</td>
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<td>V</td>
<td><a href="mailto:downstream@dsimwr.com">downstream@dsimwr.com</a></td>
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<td>17</td>
<td>Tom Helm</td>
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<td><a href="mailto:thecm74@y4ho.com">thecm74@y4ho.com</a></td>
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<td>18</td>
<td>Alex Gutsch</td>
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<td>19</td>
<td>Zuming Xia</td>
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<td>20</td>
<td>Drew Mickus</td>
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<td><a href="mailto:dmickus@freesjete.com">dmickus@freesjete.com</a></td>
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<td>21</td>
<td>Reggie Holt</td>
<td>FISINA</td>
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<td><a href="mailto:reggie.holt@edkt.gov">reggie.holt@edkt.gov</a></td>
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<tr>
<td>1</td>
<td>Gregg Freeby</td>
<td>ASB1</td>
<td>G</td>
<td><a href="mailto:Gregg.Freeby@asbi-associ.org">Gregg.Freeby@asbi-associ.org</a></td>
<td>PS</td>
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<td>2</td>
<td>Bob Swanson</td>
<td>StructuraTech</td>
<td>G</td>
<td><a href="mailto:BSwanson@vsl.net">BSwanson@vsl.net</a></td>
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<td>Jack Torok</td>
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<td>Zorica Zivanovic</td>
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<td><a href="mailto:Zorica.Zivanovic@freyssinet.com">Zorica.Zivanovic@freyssinet.com</a></td>
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PTI POLICY STATEMENT ON COMPLIANCE WITH ANTITRUST LAWS

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.
6.0 — REFERENCES


SPECIFICATIONS


APPENDIX A — TROUBLESHOOTING GROUTING PROBLEMS

A.1 — Problems and solutions
It is assumed that grouting will be successful if the ducts are not damaged, the tendons are properly placed, the grout has the proper composition and efflux time, and a continuous one-way flow of grout is maintained during injection until all pockets of air and water are removed. Some of the problems that may not be detected that could lead to less than adequate protection of the prestressing steel in certain areas include duct line plugs, downtime, equipment breaks and outages, cross-grouting between ducts, and the formation of water lenses and air voids.

A.1.1 — Duct line plugs
Duct line plugs can be caused by damage to the duct, foreign material within the duct, and rapid stiffening of the grout. Damage to the duct that is not repaired before the placement of the concrete can be difficult to correct and will usually require removal of the concrete. Loose foreign material is usually removed when the ducts are blown through with oil-free and water-free compressed air.

A.1.2 — Downtime, equipment failures, and outages
Unanticipated delays or stoppages during a partially completed grouting operation can lead to significant difficulties. It is necessary to have sufficient equipment on hand in the event a malfunction occurs. If the grout in the partially filled duct takes an initial set, then the Contractor shall prepare remedial proposals for the review and approval of the Construction Engineer. This work may include the drilling of vents at the leading edge of the grout to relieve excessive water and then regrouting from that point forward.

A.1.3 — Cross grouting (unintended grout flow between ducts)
Cross grouting can occur through improperly sealed joints between ducts, at splices in beams, and at joints between precast components that have not been fully and properly sealed with epoxy or similar bonding agents. Quality workmanship in sealing ducts is paramount. Seals can usually be checked by blowing oil-free and water-free compressed air through the ducts first. If it is not possible to repair a seal and there is a chance of cross-grouting, then all the affected tendons should be grouted in one continuous operation. Sufficient material and equipment should be on hand for a satisfactory operation. The sequence of injecting grout and sealing outlets should be reviewed. It may be necessary to inject grout into two or more ducts or inlets simultaneously, depending on the location of the bad seal.

Extra care should be taken to thoroughly vent all “slugs” of air and water at all vents prior to closing them. Raising the vent, inlet, and outlet tubes above the level of the adjacent tendon following grouting causes a standpipe effect for collection of entrapped air and water in some situations. Inspection of these elevated tubes the next day can provide an indication of the need for further investigation of possible voids or bleed water pockets.