

MINUTES

PTI DC-20 Building Design Committee

Monday, April 25, 2016, 1:30 PM - 5:30 PM
Renaissance Long Beach - Long Beach, CA

Voting Members Present (10 of 12)

Carol Hayek, Chair
Martin Maingot, Secretary
Rashid Ahmed
Bryan Allred
Asit Baxi
Martin Cuadra
Thomas Gillard
Jonathan Hirsch
Thomas Kang
Don Kline
Cary Kopczynski, TAB Contact, V
Eric Ober
Miroslav Vejvoda, NV

CCL USA, Inc.
SCA Consulting Engineers
Walker Parking Consultants
Seneca Structural Engineering, Inc.
Baxi Engineering Inc.
Uzun & Case Engineers
Ellinwood + Machado
Bentley Systems
Seoul National University
Kline Engineering & Consulting, LLC
Cary Kopczynski & Co., Inc., PS
Simpson, Gumpertz & Heger
PTI Staff

Associate Members Present

Joseph Ales
Mohammed Bilbeisi
Spencer Lee
Carine Leys
Rafael Machado
Sivakumar Munuswamy
Xu Shudong
Zuming Xia
Mark Yerges

Walter P Moore & Associates, Inc.
Freyssinet Middle East
ADAPT Corporation
ADAPT Corporation
Ellinwood + Machado
Thornton Tomasetti
Beijing Yintaijian Prestressing Engineering Co., Ltd.
VSL
CBM Engineers

Visitors

Hamid Ahmady
David Peralta
Jeremy Pearce
Arnaud Thibonnier
Hossam Saleh
Bill Ramrattan
Lance Osborne
Sharah Murthy
Nandish R.P.
Rattan Khosa

ACTION ITEMS FROM LAST / THIS MEETING

Item #	Subject	Action	Responsible	Deadline / Completed
1	Slides for Guide for Design of PT Buildings	TG review and comment of presentation module slides for subsequent balloting	Modules 1, 3, 6: Maingot, Hayek, Yerges; Modules 1, 2, 4, 5: Baxi, Cuadra, Kang; Modules 1, 7, 8, 9: Lee, Ober, Xia; Ahmady, Saleh,, Module 10: Ahmed, Allred	Review by <u>June 15, 2016</u> ; balloting TBD
2	PTI DC20.2-88: Restraint Cracks and Their Mitigation	Produce draft of combined ADAPT-PTI DC20.2 documents for review/comment; Go-To Meeting (GTM) to review/discuss draft	Jonathan H /All	<u>July 31, 2016</u> for draft by ; <u>August 31, 2016</u> for GTM
3	DC20.7-01, Design, Construction, and Maintenance of CIP PT Concrete Parking Structures	Editable copy of existing document to committee on 10/31/15. Document update on hold pending completion of item 2		On hold
4	ACI 318 Update	ACI cross-reference document as FAQ 'cheat sheet' to help navigate ACI 318-14 post-tension provisions	Staff, Hayek	On hold
5	PT Manual 7 th Edition	DC-20 will review and comment on chapters once available, however not balloted by DC-20. Three chapters on Analysis and Design to be submitted for review by end of 05/16 with comments due end of 09/16	All	Analysis and Design chapter comments due <u>end of September 2016</u>

Agenda Item	Expected Outcome / Actions Taken
A. <u>General</u>	
A.1 Call to Order	A.1 Meeting called to order at 1:30pm
A.2 Introductions / Attendance Sheets	A.2 Minimum number of voting members for meeting ballots: 5
A.3 Committee Roster Changes	A.3 New committee Chair: Carol Hayek; Eric Ober has become a voting member; Spencer Lee and Sivakumar Munuswamy have been added as associate members. Congratulations and welcome!
A.4 PTI Antitrust Policy (Appendix A.4)	A.4 Read and acknowledged by all present
B. <u>Agenda & Minutes</u>	

Agenda Item	Expected Outcome / Actions Taken
<p>B.1 Approval of Agenda</p> <p>B.2 Approval of Minutes from 10/7/2015 (Meeting ballot)</p>	<p>B.1 Changes to Agenda: Ted Neff presentation regarding ‘high cost’ of education – Rattan Khosa discussed lack of design experience with post-tension structures (with recent examples) and proposed various options to assist engineers with PT design. DC-20 to discuss further with webinar modules as strong favorite.</p> <p>B.2 Motion / Second to approve minutes: Martin C / Jonathan H Result: 11-0-0 (Y-N-A)</p>
<p><u>C. Actions Taken Between Meetings</u></p> <p>C.1 Letter Ballots (none)</p> <p>C.2 Web Meetings (none)</p>	<p>C.1 None</p> <p>C.2 None</p>
<p><u>1. Action Item 1: Slides for Guide for Design of PT Buildings</u></p> <p>1.1 <u>Design Webinar Modules for review (Appendix 1.1)</u> Module 1: Introduction Module 2: Basics of PT Module 3: PT Systems Module 4: PT Design Concepts Module 5: Numerical Examples Module 6: Construction Process Module 7: Prestress Losses Module 8: PT Design for Flexure Module 9: Analysis of Continuous Members Module 10: Structural Diaphragm</p> <p>2.2 Additional Modules?</p>	<p>1.1 Discussion: Review of new design webinar modules and objectives:</p> <p>Carol mentioned that PTI Staff has put forward modules, we can just review these modules and add whatever material is missing All presentation modules are complete and require review/comment from committee; Carol proposed creating four (4) task groups to complete the review as follows:</p> <p>Modules 1, 3 and 6; Martin M, Carol H, Mark Y Modules 1, 2, 4 and 5; Asit B, Martin C, Thomas K Modules 1, 7, 8 and 9; Spencer L, Eric O, Hossam S, Zuming X, Hamid A Bryan A and Rashid to review and comment on Module 10</p> <p>Review comments to be submitted to PTI staff by <u>June 15, 2016</u> with reminder sent by PTI on or before <u>June 1, 2016</u></p> <p>Get answer from Miroslav if we need to ballot the slides at DC-20; Miroslav confirmed balloting of slides with date TBD (right after meeting).</p> <p>2.2 Additional module – anchorage zone; to be discussed at a later time</p>
<p><u>2. Action Item 2: PTI DC20.2-88, Restraint Cracks and Their Mitigation in Unbonded Post-Tensioned Building Structures</u></p> <p>2.1 <u>Status and New Criteria</u> PTI chapter updates and original author’s updates.</p>	<p>2.1 Discussion: New objectives including Bijan Aalami’s updates: Recent ADAPT document for review and comment by committee; intent is to merge PTI DC20.2-88 document and ADAPT publication to</p>

Agenda Item	Expected Outcome / Actions Taken
<p>2.2 PTI Chapter Updates (Appendix 2.2)</p> <p>Assignments: 1-Introduction & Scope: Cary 2-Causes of Cracking: Eric / Martin C. 3-Analysis Techniques: Jonathan / Carol 4-Crack Mitigation: Bryan / Rashid 5-Structural Evaluation of Cracks: Asit / Martin C. 6-Repair of Restraint Cracks: Don 7. Conclusions and Recommendations; Martin M and Thomas K</p> <p>2.3 Bijan Aalami's Updates (Appendix 2.3)</p>	<p>produce a more complete and comprehensive design aid. Use of shrinkage reducing admixtures and shrinkage compensating concrete to be added as possible shrinkage mitigation measures, but with limitation. Add concrete mix design and curing procedures as mitigation measures.</p> <p>2.2 Reports by Chapter leads on progress and completion dates: Jonathan H to take first pass at merging both documents and provide a basic framework/draft for review/comment by <u>July 31, 2016</u>. Major topics include introduction, crack formation, crack mitigation and crack repair. Go-To Meeting to be scheduled <u>end of August</u> after first pass document is distributed for discussion and commentary</p> <p>2.3 Discussion: Review of Bijan Aalami's updated document: Alami paper to be merged with PTI DC-20.2-88 and reproduced as a single PTI document</p>
<p><u>3. Action Item 3: DC20.7-01, Design, Construction, and Maintenance of Cast-in-Place Post-Tensioned Concrete Parking Structures</u></p> <p>3.1 Update of DC20.7-01 on hold temporarily; TG (Rashid, Tom, Martin C., Eric)</p>	<p>Focus is on module slide comments and ADAPT – PTI DC20.2 document merge efforts; remains <u>on hold</u>.</p> <p>3.1 Editable copy of existing document was sent to committee on 10/31/15.</p>
<p><u>4. Action Item 4: PT Manual 7th Edition</u></p> <p>4.1 PT Manual Updates: Status TAB TG (Asit is Lead)</p> <p>4.2 Review of work items for DC-20</p>	<p>4.1 Discussion: Status of the PT Manual updates: Asit mentioned all chapters have been assigned to authors, however still in progress with hopefully more activity within the next 6 months. DC-20 will review and comment on chapters once available, however they will not be balloted by DC-20.</p> <p>4.2 Discussion: Progress of DC-20 contributions: Three chapters on Analysis and Design to be submitted for review by end of May 2016 with comments due <u>end of September 2016</u>.</p>
<p><u>5. Codes and Standards</u></p> <p>C.1 ACI 318 update</p> <p>C.2 ACI 423 update</p> <p>C.3 Other ACI updates</p>	<p>C.1 Suggested committee produce a roadmap to locate all code requirements as they relate to PT design; provisions are scattered throughout the code and challenging to follow. Create an FAQ for this purpose? Carol suggested to reproduce the existing ACI comparison table/transition key as an FAQ cheat sheet that summarizes all provisions related to PT and highlight technical changes. No timeline set for FAQ as focus is on module slide comments and on ADAPT-PTI</p>

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	<p>document merge efforts.</p> <p>C.2 No update</p> <p>C.3 Don mentioned ACI balloted a change to one-way slab cracked moment of inertia calculation for unbonded tendons; Asit mentioned lack of requirements of minimum P/A for one-way slabs. Also, when does the 0.004Ac minimum bonded reinforcing requirement apply relative to slab precompression? No clear direction from ACI 318. Should there be maximum tendon spacing for one-way slabs? Intent is to provide clarification on these items to eliminate confusion and potentially provide a minimum standard.</p> <p>Asit mentioned anchorage zone provision issues also being discussed/reviewed at ACI; one item is the requirement for reinforcement parallel to added tendons which may not be needed in all situations/conditions.</p>
<p>6. <u>Two-Way Banded PT</u></p> <p>6.1 Two-Way Banded PT – Research Proposals</p> <p>6.2 TN – Two-Way Banded PT – Analytical Approach</p>	<p>6.1 UT and UCLA proposals considerably over PTI budget and realistic reach.</p> <p>6.2 Discussion: TN – Two-Way Banded PT – Analytical Approach: Update – Jonathan and Carol to work together and create a draft</p> <p>Update – Carol mentioned current code does not allow two-way banded layout and has been considered as an ‘alternate’ system that would be more agreeable to office and hospital occupancies; Sivakumar to distribute documentation of banded-banded slab design both in practice (actual project) and in text book (circa late 1960’s) for review and discussion at next meeting.</p>
<p>E. New Business</p> <p>E.1 <u>FAQ – Restrained vs. Unrestrained Condition for PT Slabs</u> On hold until further direction from TAB.</p> <p>E.2 Any other new business?</p>	<p>E.1 – no update</p> <p>E.2 How best to educate engineers for PT design? Educate practicing engineers at large on how to appropriately interpret and implement code provisions in addition to practical considerations through webinar modules</p> <p>Don mentioned any projects/research efforts need to be proposed to TAB soon in order to get in position for potential funding through PTI.</p> <p>Asit mentioned DC-70, DC-100 and DC-110 may potentially become task groups within DC-20 to reduce total number of technical committees and use task groups as extensions of committee efforts.</p>

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	Lab testing has been proposed to challenge the common assumption of uniform PT final effective force over tendon length once a structure is in service (force equalization over time). In discussions with Thomas Kang, it appears similar testing is already underway on a building under construction in Korea. Thomas to provide supporting data/documentation for review and further discussion at next meeting.
F. <u>Next Meeting</u> F.1 2016 PTI Committee Days Tucson, AZ, October 5-7, 2016 F.2 Web Meetings:	F.1 See you in Tucson! F.2 Draft of ADAPT-PTI DC20.2 merge document webinar set for end of August 2016 with actual date TBD based on date draft is released
G. <u>Adjourn</u>	G. Meeting adjourned at: 5:27pm

AGENDA / MINUTES EXHIBITS

Exhibit #	Subject
A.2	Attendance sheet
1.1	
1.2	
1.3	

Committee Attendance Sheet

Committee: PTI DC-20 Date: 04/25/16

Meeting Location: LONG BEACH, CA

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

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.

#	Name	Company	Voting/ Associate/ Guest	E-Mail	Policy*
1	MARTIN MAINGOT	SCA CONSULTING ENR.	V	MAINGOTM@SCAENGINEERS.COM	✓
2	Carol Hayek	CCL	V	chayek@cclint.com	✓
3	SPENCER WEBB	ADAPT		spencer@adaptsoft.com	✓
4	Jonathan Hirsch	Butley	V	jonathan.hirsch@butley.ca	✓
5	SWAKUMAR MUNUSWAMY	Thornton Tomasetti	Am	smunuswamy@thornton tomasetti.com	✓
6	ZUMING XIA	VSL	ASSO.	zxia@structuraltec.com	✓
7	RAFAEL MACHADO	ELLIWOOD-MACHADO	ASSO.	RMACHADO@ELLIWOODMACHADO.COM	✓
8	Hamid Ahmady	Suncoast	G	HA@Suncoast-PT.COM	✓
9	David Peralta	Unitech	G	dperalta@unitech.com	✓
10	JEREMY PEARCE	CULP AND TANNER	G	JPEARCE@CULPANDTANNER.COM	✓
11	ERIC OBER	SGH	V	erober@sgh.com	✓
12	Don Kline	KEC	V		✓
13	Bryan Allred	SENECA	V	Bryan@SenecaStructural.com	✓
14	Rashid Ahmed	Walker Parking	✓	rashid.ahmed@ walkerparking.com	✓
15	CARINE M. LEYS	ADAPT CORP.		CARINE@ADAPTSOFT.COM	✓

Committee: _____ **Date:** _____

Meeting Location: _____

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#	Name	Company	Voting/ Associate/ Guest	E-Mail	Policy*
1	ARNAUD THIBONNIER	ADAPT CORP.	GUEST	ARNAUD@ADAPTSOFT.COM	✓
2	MARTIN CUADRA	UZUN + CASE	✓	MQUADRA@UZUNCASE.COM	✓
3	ASIT N BAXI	Baxi Engineering	✓	asit@baxi-eng.com	✓
4	Thomas Kang	Seoul National Univ.	✓	tkang@gnu.ac.kr	✓
5	Hossam Saleh	can consulting	G	hossam.saleh@canconsulting.ca	✓
6	MARK YERGES	CVM ENGINEERS	A	myerges@cvmprofessionals.com	✓
7	BILL RAMRATAN	CPMK CONTR. LTD	G	billsramrattan@gmail.com	✓
8	Lance Osborne	Meadow Burke	G	rosborne@meadowburke.com	✓
9	SHARATH MURTHY	VSL/STRUCTURAL TECHNOLOGIES	G	smurthy@structural.net	✓
10	NANDISH R.P.	NEPT	G	nandish@neps.in	✓
11	RATTAN L. KHOSA	AMSYSCO, Inc.	G	rkhosa@amsyscoinc.com	✓
12					
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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.