

**March 10, 2003**

**To: ACI 440 Members**

**Fm: John P. Busel, ACI 440 Secretary**

**Re: Committee Update and Pre-read Materials for Vancouver**

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- 1) This email and enclosed document (16-page) includes the following:
  - a. 440 Main Meeting Agenda
  - b. 440 Committee Schedule (Attachment 1)
  - c. 440 Main last meeting minutes (Phoenix) (Attachment 2)
  - d. 440 Membership summary (Attachment 3)
  - e. 440 Subcommittee Agenda's (Attachment 4)
- 2) By now, everyone should have received Ballots and documents from Dr. Rizkalla regarding:
  - a. ACI 440-I *Guidelines for Prestressing Concrete Structures with FRP Tendons*
  - b. ACI 440-K *Recommended Test Methods for FRP Bars and Laminates*

Ballot Submittal **Deadlines** are:

- a. ACI 440-I Friday, March 21, 2003
- b. ACI 440-K Wednesday, March 26, 2003

If you have not received a Ballot by email, contact Sami Rizkalla at [Sami\\_Rizkalla@ncsu.edu](mailto:Sami_Rizkalla@ncsu.edu)

**Please submit your Ballots by the deadline. Voting is important. Your cooperation is appreciated.**

- 3) FRP Beam Competition – On Sunday, March 30, the competition will be held at the Hyatt, Regency C. Your participation is requested.
- 4) **ACI 440 Webpage** – If you have not done so, please visiting the 440 webpage at [www.concrete.org/COMMITTEES](http://www.concrete.org/COMMITTEES) search and select 440.  
**First**, you must register on the ACI website homepage and get a login registration with password. The 440 webpage has available for download:
  - Draft Subcommittee documents
    - Chapters for State-of-Art Report (440-C)
    - Professional Education PowerPoint Presentations (440-E)
    - Documents for review (440-H)
  - Draft and Approved meeting agenda's and minutes
  - Other pertinent committee information.
  - Specifically, those documents available are:
    - 440-C Chapter 6 Reinforcement
    - 440-C Chapter 9 Stay in Place Formwork
    - 440-E Course on FRP Rebar (soon)
    - 440-E Course on Repair (soon)
    - 440-H Structural Grid Draft 1-7-03
    - Phoenix 2002 Unapproved Minutes 440-C
    - Phoenix 2002 Unapproved Minutes 440-D
    - Phoenix 2002 Unapproved Minutes 440-G
    - Phoenix 2002 Unapproved Minutes 440-I
    - Phoenix 2002 Unapproved Minutes 440-J
    - Phoenix 2002 Unapproved Minutes 440-L
    - Phoenix 2002 Unapproved Minutes 440-M

# AGENDA

Rev: 3-6-03

## ACI COMMITTEE 440 – FRP REINFORCEMENT

**Main Committee Meeting**  
**Tuesday, April 1, 2003 - 2:00 pm – 6:30 pm**  
**Vancouver, Canada – Fairmont Hotel, British Room**

Chair: Dr. Sami H. Rizkalla

1. **Call the meeting to order**
2. **Attendees self-introduction (name, affiliation)**
3. **Approval of the agenda**
4. **Approval of the last meeting minutes** – October 29, 2002 (*Attachment #2*)
5. **Chairman’s report** – Rizkalla
6. **Membership Report** – Thomas (*Attachment #3*)
  
7. **Voting – Ballot Status**
  - a) 440-K Material Characterization (Benmokrane/Gentry) - present Results of Ballot, Discuss negatives
  - b) 440-I Prestressed Concrete (Campbell/Dolan) – present Results of Ballot, Discuss negatives
  
8. **Subcommittee Reports** (*agenda’s Attachment #4*)
  - a) 440-C State-of-the-Art Report (Shahawy/Green)
  - b) 440-D Research (Porter/Harries)
  - c) 440-E Professional Education (Scott/Steffen)
  - d) 440-F Repair (Blaszak/Gold)
  - e) 440-G Student Education (Brown/Newhook)
  - f) 440-H Reinforced Concrete (Nanni)
  - g) 440-J Stay-in-Place Structural Formwork (Mirmiran/Fam)
  - h) 440-L Durability of FRP Concrete Structures (Karbhari/Hamilton)
  - i) 440-M Repair & Strengthening Masonry Structures (Gergely/Steere)
  
9. **New business**
  
10. **Liaison member reports**
  - a) Other ACI Committees (408 Bond, 423 PC, 441 Columns, 503 Adhesives, 554 FRC, 445 Shear & Torsion, 435 Deflection)
  - b) MDA of the FRP Composites Industry (Busel)
  - c) ISIS Canada (Neale)
  - d) FRP International (Harik)
  - e) ASCE SPC and Standard (Karbari, Porter)
  - f) SAMPE (Kliger)
  - g) CSCE (Green)
  - h) JCI, JSCE, AIJ
  - i) FIB, RILEM (Taerwe)
  - j) ASCE Journal - Composites for Construction (Bank)
  - k) ICBO (Horeczko)
  - l) ISO (Neale)
  - m) TRB A2C07 (Shahawy)
  
11. **Announcements, Open discussion**
  
12. **Adjourn**

## Attachment 1 - Committee Schedule

### ACI 440 Meetings Spring 2003 Convention – Vancouver, BC Canada

Revised February 14, 2003 (changes noted in blue)

Legend: F = Fairmont Hotel, H = Hyatt Regency

440	Fiber Reinforced Polymer	Tue	2p-6:30p	F- British
440-C	FRP-State-of-Art	Tue	10a-12p	F- Tweedsmuir
440-D	FRP-Research	Mon	1p-2:30p	F- Boardroom
440-E	FRP-Prof. Education	Tue	11:30-1p	F- Gabriola
440-F	FRP-Repair-Strengthening	Mon	8:30a-12p	F- Waddington
440-G	FRP-Student	Mon	2:30p-3:30p	F- Boardroom
440-H	FRP-Reinforced Concrete	Sun	8:30a-12p	F- Saturna
440-I	FRP-Prestressed Concrete	Sun	2p-4:30p	F- Saturna
440-J	FRP Stay-in-Place Formwork	Tue	8:30a-10a	F- Tweedsmuir
440-K	FRP-Material Characteristics	Mon	3:30p-6:30p	F- Waddington
440-L	FRP-Durability of Concrete Struc.	Sun	12p-2p	F- Saturna
440-M	FRP-Repair of Masonry Structures	Tue	8a-10a	F- Boardroom
440-R	FRP-Paper Review	Sat	8:30a-5p	H- Sales Boardroom A

	<b>SATURDAY, March 29</b>			
440-R	FRP-Paper Review	Sat	8:30a-5p	H- Sales Boardroom A
	<b>SUNDAY, March 30</b>			
440-H	FRP-Reinforced Concrete	Sun	8:30a-12p	F- Saturna
440-L	FRP-Durability of Concrete Struc.	Sun	12p-2p	F- Saturna
440-I	FRP-Prestressed Concrete	Sun	2p-4:30p	F- Saturna
	FRP Concrete Beam – Student Competition	Sun	1p-5p	H – Regency C
	<b>MONDAY, March 31</b>			
440-F	FRP-Repair-Strengthening	Mon	8:30a-12p	F- Waddington
440-D	FRP-Research	Mon	1p-2:30p	F- Boardroom
440-G	FRP-Student	Mon	2:30p-3:30p	F- Boardroom
440-K	FRP-Material Characteristics	Mon	3:30p-6:30p	F- Waddington
	<b>TUESDAY, April 1</b>			
440-J	FRP Stay-in-Place Formwork	Tue	8:30a-10a	F- Tweedsmuir
440-M	FRP-Repair of Masonry Structures	Tue	8a-10a	F- Boardroom
440-C	FRP-State-of-Art	Tue	10a-12p	F- Tweedsmuir
440-E	FRP-Prof. Education	Tue	11:30a-1p	F- Gabriola
440	Fiber Reinforced Polymer	Tue	2p-6:30p	F- British

## Attachment 2 - Last meeting minutes – October 29, 2002

### Minutes ACI Committee 440-FRP Reinforcement

Main Committee Meeting  
2:00 pm – 6:35 pm  
Tuesday, October 29, 2002  
Point South Mountain Resort, Phoenix, AZ

Chairman: Dr. Sami Rizkalla  
Secretary: Mr. John P. Busel

#### Attendees:

##### **Voting Members:**

ALKRDAJI, TAREK  
BAKIS, CHARLES  
BALAGURU, PN  
BENMOKRANE, BRAHIM  
BLASZAK, GREGG  
BROWN, GORDON  
BROWN, VICKI  
BUSEL, JOHN  
CAMPBELL, THOMAS IVAN  
DOLAN, CHARLES  
FALLIS, GARTH  
FYFE, EDWARD R  
GENTRY, T RUSSELL

GERGELY, JANOS  
GOLD, WILLIAM J  
GRACE, NABIL  
GREEN, MARK F  
GREMEL, DOUG D  
HAMILTON, III TREY  
HARRIES, KENT A  
HENDERSON, MARK P  
HORECZKO, BOHDAN  
MOSALLAM, AYMAN S  
NANNI, ANTONIO  
NEWHOOK, JOHN  
PORTER, MAX L

RASHEED, HAYDER  
RIZKALLA, SAMI  
SCHUPACK, MORRIS  
SCOTT, DAVID  
SHIELD, CAROL  
SOUDKI, KHALED  
STEFFEN, ROBERT  
THOMAS, JAY  
TOUTANJI HOUSSAM  
VATOVEC, MILAN  
WHITE, DAVID

##### **Associate Members:**

AROCKIASAMY, M  
BRENA, SERGIO  
BOYD, ANDREW  
BURGUENO, RIGOBERTO  
DANIALI, SAEED  
EDWARDS, HAROLD  
EHSANI, MOHAMMAD  
EL-HACHA, RAAFAT  
FALLIS, GARTH J

FAM, AMIR  
FAZA, SALEM S  
GERGELY, JANOS  
GREENE, ROBERT  
GREGORIAN, ZAREH  
GROSS, SHAWN  
HAMILTON, TREY  
IBELL, TIM

KRSTULOVIC-OPARA, NEVEN  
LEVAR, JOHN  
LOPEZ, MARIA DEL MAR  
MASMOUDI, RADHOUANE  
MYERS, JOHN J  
PAUER, RICK  
TUMIALAN, J GUSTAVO  
WALKUP, STEPHANI  
ZIEHL, PAUL

##### **Visitors:**

BARR, EHREN  
BARRES, JOAQUINN  
CASADEI, PAOLO  
CHONG, WOON  
DUBAY, ASHISH  
EWEN, MARK

GALATI, NESTORE  
IOSMET, CAMIEL  
LAMANNA, TONY  
LARSON, KYLE  
NAKAGOSHI, AKIRA  
NATARAJAN, NANDA

PARETTI, RENATO  
SILVA, PEDRO  
WEST, JOHN  
WITT, SARAH  
ZALESIK, CHUCK

1. Chairman Rizkalla called the meeting to order at 2:00 pm. The attendees made self-introductions.
2. Mr. Chuck Zalesiak addressed the 440 committee on ACI TAC updates. He welcomed the activity level of 440 documents. TAC document review has declined. Convention sessions are down for Boston and encouraged 440 to propose sessions. He noted that the TCM was updated and reissued. Emerging Technical Document has a life of 10 years. Key issues are up to committee regarding to how well the technical document is developed. Both 440 and

TAC must agree whether the tech is developed. TAC encourages updates and no limits were established. Type of updates, whether errata or other format are flexible. He added that ACI 318-F includes all new technology. The committee encourages visitors and attendees to the meeting. He suggested several options regarding how to reply to TAC depending on the comments TAC submits to the committees.

3. Dr. Newhook motioned to approve the agenda. The motion was seconded. The Agenda was approved as written.
4. Dr. Balaguru motioned to approve the last meeting minutes of April 23, 2002 from Detroit as written. Dr. Newhook seconded the motion. Dr. El-Hacha corrected the minutes as follows: Report by 440-I, line 10, delete “and Durability factors”. The motion passed to approve the minutes as corrected.

### **Chairman’s Report**

5. Dr. Rizkalla announced that the 440.2R-02 “Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures was published by ACI and ready for distribution. This was a result of the dedicated efforts of the 440-F subcommittee. He thanked Dr. Nanni and Mr. Blaszak for organizing sessions two very successful sessions on “ACI Design Guidelines for Use of FRP. “ Hr thanked the 440-J subcommittee and specifically Drs. Mirmiran and Hayder for organizing the session on “research Advances in FRP Stay-in-Place Formwork Technology.” He recognized the Market Development Alliance and the MDA FRP Rebar Manufacturers Council for donating \$5K to the 2003 ACI FRP Beam Competition. He announced that TAC approved a special publication on “Deflection control for the Future” jointly sponsored with ACI 435. He encouraged all members to attend FRPRCS–6 in Singapore July 6-10, 2003. He reported that 440-K Ballot results will be discussed today and thanked Dr. Benmokrane and Dr. Gentry for their leadership efforts. He announced that ACI is sponsoring the first international conference on “Innovative Materials and Technologies for Construction and Restoration” IMTCR-04, June 6-9, 2004 in Lecce, Italy. Request from ACI 215 (Fatigue) was made to organize two sessions in Boston related to fatigue. Contact Dr. Toutanji who is co-chairing this session. Twelve papers are needed to produce a special publication. He suggested that in future ACI 440 meetings include technology presentations in addition to administrative procedures. He announced that ACI 342 Bridge Evaluation is planning on having a technical session in San Francisco (Fall 2004) on load testing of bridges. ACI 440 members are strongly encouraged to submit abstracts when the call comes out related to full composite bridges and FRP strengthened bridges. Contact Dr. Meyer with any questions.

### **Membership Report**

6. Mr. Thomas delivered the membership report (see attachment 1). He stated that the current committee list was attached to the meeting pre-read materials. Changes from the Detroit Meeting indicate a 10% drop in voting members. Overall membership increased from 196 to 208. Mr. Green asked if ACI recommends a particular balance within the committee. Dr. Rizkalla suggested that the committee should consider increasing the user participation. Dr. Rizkalla stated that the committee voting members should try to achieve a good balance.

## Voting – Ballot Status

7. Dr. Benmokrane distributed 2 documents: one summary sheet, the other a detailed listing of negative votes from the committee. He discussed revisions to resolve the negative votes. Dr. Gentry reported that 77 negative votes were tabulated and around 50 negative votes were resolved in the subcommittee. Dr. Rizkalla stated that the 440 Committee would ballot only the changes to the document. He added that the document does not need to be reballoted. The ballot must be complete and submitted to TAC before January 15, 2003. He confirmed that ACI procedures state that all members must know how the negatives were resolved and the items will be balloted.

Dr. Gentry reviewed the negatives and how they were resolved. The title of document was changed to reflect “Bar” instead of “Rod” and “Laminate” instead of “Sheet”. Test method notation will reflect, “Bar” and “Laminate” instead of “Rod” and “Sheet”. The Committee discussed proper calculations for cross section area. The result of this discussion is to change the language to reflect effective diameter.

The Committee debated whether to include R.3a and R.3b, which provide a choice of two methods for bond strength. The committee debated how to present and ballot both revisions of the test method. Dr. Rizkalla stated that balloting only the negatives would be done. However, if there is still a negative, the committee could still resolve the negative by approving the test method. Dr. Rizkalla reiterated the process.

8. Dr. Nanni motioned to ask a question of the Committee as follows: Does the Committee wish to have the 440-K document approved for TAC by March 2003 in Vancouver from a ballot submitted in January 2003. Dr. Newhook seconded motion. Discussion centered on the work committed to date. The results of the vote were: YES: 26, NO: 0, ABSTAIN: 1. **The motion passed.** Dr. Rizkalla suggested the 440-K Subcommittee co-chairman ballot the resolutions as noted during the Subcommittee meeting for all comments including editorial.
9. Dr. Nanni motioned to that the 440 Members follow the recommendation of the Subcommittee to remove R.3 from the document submitted to TAC. Dr. Scott seconded the motion. Dr. Nanni amended the motion to remove R.3 from the document that is submitted to TAC. Discussion noted that the Subcommittee did not make this recommendation. This action allows the Committee to vote Yes or No regarding the inclusion of the test method. Dr. Rizkalla noted that the Subcommittee identified three different options regarding the Bond Test. These tests include the pullout test, a modification to an existing ASTM test method, and a specially designed test method for bond. The results of the vote were: YES: 14, NO: 12, ABSTAIN: 0. **The motion did not pass.** Dr. Rizkalla stated the test R.3 will not be included in the new ballot to be completed in January 2003.
10. Dr. Gentry continued the discussion of the resolved comments. There was a short discussion on the alkaline solution and related chemistry.
11. Dr. Gentry motioned to request all 440 Voting Members to accept all actions by the Subcommittee, including non-persuasive and persuasive for test methods R.1 to R.13. This

excludes the negatives submitted by Dr. Dolan, which were skipped. The results of the vote were: YES: 28, NO: 0, ABSTAIN: 0. **The motion passed.**

12. Dr. Gentry motioned to request all 440 Voting Members to accept all actions by the Subcommittee, including non-persuasive and persuasive for test methods S.1 to S.4. This excludes the negatives submitted by Dr. Dolan, which were skipped. The results of the vote were: YES: 25, NO: 0, ABSTAIN: 0. **The motion passed.**
13. Dr. Gentry continued to review comments on the Appendices A.1 and A.2. Dr. Gentry motioned to request all 440 Voting Members to accept all actions by the Subcommittee, including non-persuasive and persuasive for A.1 to A.2. The results of the vote were: YES: 27, NO: 0, ABST: 0. **The motion passed.**
14. Dr. Dolan reviewed his negative comments for the entire document. He suggested to the co-chairman to develop a table that lists the ASTM test methods and note the modifications as presented in the document in the general instructions section of the document. He withdrew his negative comments throughout the document. His complain was about standards mix, as it was not defined. Dr. Dolan offered several solutions. He recommended a mix of 4000-6000 psi to be used throughout all test methods. There was a discussion regarding providing either a lower limit or range for pH for the alkalinity solution. It was decided to use a range of 12.6–13.5 pH. Short discussion debated the length of time for the long-term relaxation of rods test method. The result was a range of 1000–10,000 hours, with a preferred time of 10,000 hours. Dr. Dolan withdrew his negatives based on the Committee acceptance of his resolution.
15. Dr. Rizkalla stated that in consultation with Mr. Zalesiak, the 440-K ballot can be passed by discussing the negatives as new business, but inform all members how the negatives were resolved.
16. Dr. Dolan brought up the issue of Dr. Porter’s proposed R.3 test methods. The Committee agreed to consider a new improved R.3 test method, which will be balloted as a full ballot. This process is separate from the ballot, which reviews the resolved comments as discussed by the full Committee.

#### Subcommittee Reports

##### 17. 440H

Dr. Nanni reported new business to create sessions in Boston. He proposed 3 sessions to cover FRP field applications for construction covering both internal and external reinforcement. Volunteers for presenters will be communicated to the full membership. Dr. Dolan suggested not duplicating the presentations in Singapore. The “H” Committee reviewed the TAC Committee response communicated to the 440 members as an attachment to the Main Meeting. Small changes in responses were noted. He stated that a new ballot would be distributed before Vancouver Meeting, to address the change. He also noted new exciting work on thin grids as led by Dr. Gordon Brown.

#### 440C

Dr. Green reported that the SOA Report has 13 chapters; 5 are complete and reviewed, 6 are complete and under review, 2 are incomplete. It is scheduled on January 15, 2003 to have a full document drafted and reviewed. Input is needed from the respective subcommittees. Between Jan. 15–Feb. 15, the editorial committee is to review the document. The subcommittee expects to ballot internally before Vancouver. The new SOA Report will incorporate relevant information from the previous version from 1996. The subcommittee discussed the relationship to other documents and subcommittee work. Decided that reference can be made only to published/approved documents.

#### 440D

Dr. Porter reported that a chapter prepared on research was passed to 440-C. The Subcommittee agreed to write an article and post the information on the website. The Subcommittee decided to organize and request funding of a workshop on FRP Research for Construction.

#### 440-E

Dr. Scott reported on 2 separate modules on Repair and Rebar. A dry run of the modules was delivered at the CFA conference in Atlanta last month. He reported that it might be a difficult process within ACI to create a successful seminar. The process includes a market research that justifies the existence of the proposed seminar. Dr. Scott will be presenting to E601 Committee the proposal for a seminar and make them aware of the creation of the educational modules. He stated that he will do all he can to make the process move forward. Mr. Busel stated that Dr. Steffen and Dr. Scott are to be complemented for the successful presentation at the 1-day workshop conducted at CFA in Atlanta. Dr. C. Dolan suggested noting the ACI Special Publication (SP) created several years ago with 5 years statistics; showing projected increased growth of the industry in the area of construction.

#### 440-F

Dr. Gold congratulated the Main Committee for the successful launch of the 440.2R – 02. He reported that the Subcommittee is continuing work with high activity by several task groups to address key issues relative to repair and strengthening. The Subcommittee is looking to ballot several documents prior to the next convention. Mr. Blaszak reported that the ACI 369 intends to create a document on seismic retrofit. It was agreed that both 440-F and 369 should create a dialogue in the area of seismic retrofit.

#### 440-G

Dr. Newhook reported on the FRP Beam Competition that will take place in the spring of 2003 in Vancouver. He reported that Hughes Bros. Contributed \$2000 to clear the debt. MDA and MDA's FRP Rebar Council donated \$5000. This makes the financial status in a very good shape. Competition is to be held on site at the convention hotel. He asked for the participation by colleagues and universities and volunteers to be judges. Three sets of bars from Hughes Bros, Pultrall and Dow Chemical will be supplied and distributed to the student teams worldwide. Next competition is scheduled in the year 2005. The Subcommittee is considering the development of a student coursework. A general outline for such a coursework was developed. More work is needed to identify areas of future work.



#### 440-I

Dr. Dolan reported that the Subcommittee ballot comments were reviewed. They clarified the overall content of the document. A new version is to be completed and redistributed with the Subcommittee in early December. After review the results from the Subcommittee, a ballot is expected in the spring of 2003. Results of the ballot will be discussed in at the Vancouver meeting. For the 440-C SOA Report, the committee will review the prestressing chapter. Dr. Rizkalla gave a presentation to the ACI 423 that reviewed the content of the proposed 440-I document.

#### 440-J

Dr. Fam reported that a draft SOA report was completed including several iterations. It was suggested to take the report and make it a chapter for 440-C SOA Report.

#### 440-L

Dr. Hamilton reported the subcommittee completed a draft of the report. The Subcommittee discussed each chapter. The following decisions were taken:

- Chapters on rebar, strengthening and stay-in-place forms would emphasize outcomes and descriptions with only critical references. Annotated bibliographies would be added as appropriate as appendices.
- Brahim Benmokrane, Max Porter and Doug Gremel would synthesize the current chapter or rebar following the above philosophy.
- The chapter on case studies would be deleted from the document.
- Continued discussions would be held related to the use and determination of knockdown factors.
- All suggested improvements are to be submitted to the co-chairs Trey Hamilton and Vistasp Karbhari over the next few weeks after which they would finalize the document and have it ready for subcommittee ballot in Vancouver.
- A separate task group was established for the collection of field case studies.
- Based on discussions with Dr. Rizkalla, the durability chapter for the 440-C SOA Report would be submitted by 440-L.
- The Subcommittee decided to deal with case studies as a separate issue.
- The Subcommittee requested 2 sessions to be given at the Boston conference. Dr. Hamilton was asked to prepare a proposal for a request to TAC.

#### 440-M

Dr. Gergely reported that the Subcommittee created a draft of the future SOA document. He stated that TMS Existing Masonry Committee is working with 440-M in joint committee activities. The Subcommittee discussed several new emerging technologies. The Subcommittee is requesting the 440 Main Committee for help in the areas of: 1) field applications, 2) blast conditions, 3) seismic retrofit and 4) durability issues related to durability.

18. Dr. Horeczko stated that in January 2003, the 3 model codes will have merged and to one organization as the International Code Council. He announced that NCSU has achieved the recognition of a worldwide-certified laboratory.

19. The Committee ran out of time to discuss the liaisons reports. Chairman Rizkalla adjourned the meeting at 6:35pm.

Respectfully submitted,

John P. Busel  
ACI 440 Secretary  
/attachment

Attachment 1

ACI 440 Committee membership changes

Change in membership between April-October 2002									
	Voting Member			Non-Voting Consulting Member			Non-Voting Associate Member		
	April	Oct	% change	April	Oct	% change	April	Oct	% change
User	17	14	-17.6%	1	5	400.0%	39	42	7.7%
Producer	14	9	-35.7%	0	1	100.0%	18	21	16.7%
General	33	35	6.1%	8	12	50.0%	66	69	4.5%
<b>Total</b>	<b>64</b>	<b>58</b>	<b>-9.4%</b>	<b>9</b>	<b>18</b>	<b>100.0%</b>	<b>123</b>	<b>132</b>	<b>7.3%</b>

ACI 440 Committee Breakdown - October 18,2002

Total Members <b>208</b>						
	Voting Member		Non-Voting Consulting Member		Non-Voting Associate Member	
		%		%		%
User	14	24.1%	5	27.8%	42	31.8%
Producer	9	15.5%	1	5.6%	21	15.9%
General Interest	35	60.3%	12	66.7%	69	52.3%
<b>Total</b>	<b>58</b>	<b>27.9%</b>	<b>18</b>	<b>8.7%</b>	<b>132</b>	<b>63.5%</b>

## Attachment 3 – 440 Membership Report

### Voting Members – 61

#### Officers

RIZKALLA, SAMI H (Chairman)

BUSEL, JOHN P (Secretary)

#### Members

ALKHRDAJI, TAREK  
BAKIS, CHARLES E  
BALAGURU, P N  
BANK, LAWRENCE C  
BELARBI, ABDELJELIL  
BENMOKRANE, BRAHIM  
BLASZAK, GREGG J  
BRADBERRY, TIMOTHY E  
BROWN, GORDON L  
BROWN, VICKI L  
CAMPBELL, THOMAS IVAN  
DOLAN, CHARLES W  
DUTHINH, DAT  
FALLIS, GARTH J  
FAM, AMIR  
FYFE, EDWARD R  
GANJEHLOU, ALI  
GEE, DUANE J  
GENTRY, T RUSSELL  
GERGELY, JANOS

GOLD, WILLIAM J  
GRACE, NABIL F  
GREEN, MARK F  
GREENWOOD, MARK  
GREMEL, DOUG D  
HAMILTON, H. R.  
HARIK, ISSAM ELIAS  
HARRIES, KENT A  
HENDERSON, MARK P  
HORECZKO, BOHDAN N  
KARBHARI, VISTASP M  
KORFF, JAMES G  
LEE, MICHEAL W.  
LEVAR, JOHN  
MAHFOUZ, IBRAHIM  
MARSH, HENRY N  
MARSHALL, ORANGE S  
MIRMIRAN, AMIR  
MOSALLAM, AYMAN S  
NANNI, ANTONIO

NEALE, KENNETH  
NEWHOOK, JOHN P  
PORTER, MAX L  
POSTMA, MARK A  
RASHEED, HAYDER A.  
SCHUPACK, MORRIS  
SCOTT, DAVID W  
SEN, RAJAN  
SHAHAWY, MOHSEN A  
SHIELD, CAROL K  
SOUDKI, KHALED A  
STEFFEN, ROBERT E  
TADROS, GAMIL  
THOMAS, JAY  
TOUTANJI, HOUSAM A  
VADOVIC, MIROSLAV  
VANDERPOOL, DAVID  
VATOVEC, MILAN  
WHITE, DAVID

### Consulting Members (non-voting) – 18

BALLINGER, CRAIG A  
BUDELMANN, HARALD  
BURGOYNE, C J  
ELHASSAN, RAMI M  
GALE, DAVID M  
GERRITSE, ARIE

IYER, SRINIVASA L  
KISHITANI, KOICHI  
NAAMAN, ANTOINE E  
OKAMURA, HAJIME  
ROSTASY, FERDINAND S  
SHAH, SURENDRA P

SONOBE, YASUHISA  
SUGITA, MINORU  
TAERWE, LUC R  
TEPFERS, RALEJS  
UOMOTO, TAKETO  
ZIA, PAUL

### Associate Members (non-voting) - 133

ABDELRAHMAN, AMR A  
ABOUTAHA, RIYAD S  
AGUINIGA, FRANCISCO  
AL-MAHAIDI, RIADH  
ALAMPALLI, SREENIVAS  
ANDERSON, ROBERT  
AROCKIASAMY, M  
ARUMUGASAAMY, PANCHY  
BANTHIA, NEMKUMAR  
BARNO, DOUGLAS S  
BONOCCI, JOHN  
BOYD, ANDREW  
BRENA, SERGIO F  
BROADWAY, ANDREW  
BURGUENO, RIGOBERTO  
CHA, JUN Y  
CHAALLAL, OMAR  
CHANG, KARL K  
CHEN, HUNG-LIANG  
CHOI, OAN CHUL  
COUSINS, THOMAS E  
CURRIER, JUSTIN B  
DANIALI, SAEED  
DANNEMANN, ROBERT W  
DE LORENZIS, LAURA  
DEITZ, DAVID H  
DONAHEY, REX  
EDWARDS, HAROLD (DAN) R  
EHSANI, MOHAMMAD R  
EL-BADRY, MAMDOUH M  
EL-DAKHAKHNI, WAEL W  
EL-HACHA, RAAFAT  
ELSANADADY, HUSSEIN  
ETMAN, EMAD  
FAZA, SALEM S  
FODEN, ANDREW J  
FROSCH, ROBERT J  
GAINES, VATANNA  
GANZ, HANS R  
GHAFOORI, NADER  
GHOBARAH, AHMED  
GILLETTE, KARL  
GOODSPEED, CHARLES H  
GOWRIPALAN, NADARAJAH

GREENBERG, ALBERT B  
GREENE, ROBERT H  
GREGORIAN, ZAREH B  
GROSS, SHAWN P  
GUGLIELMO, MICHAEL S  
GUPTA, PAWAN R  
HANSON, JAMES  
HARE, H. JOHN  
HARRIS, HARRY G  
HEFFERNAN, PATRICK J  
HOPPE, GERT E  
IBELL, TIMOTHY  
JACKSON, TODD L  
JOHAL, L S PAUL  
KACHLAKEV, DAMIAN I  
KAHN, LAWRENCE F  
KATZ, AMNON  
KLIGER, HOWARD S  
KODUR, VENKATESH KUMAR R  
KORANY, YASSER S  
KRSTULOVIC-OPARA, NEVEN  
LAMANNA, ANTHONY  
LEES, JANET M  
LOCKWOOD, JAMES D  
LOPEZ, MARIA DEL MAR  
LOPEZ-ANIDO, ROBERTO A  
LOUD, STEWART N (STEVE)  
MACHADO, ARI DE PAULA  
MALEK, AMIR M  
MALVAR, LUIS J  
MARUYAMA, KYUICHI  
MARUYAMA, TAKEHIKO  
MASMOUDI, RADHOUANE  
MCCALLION, JAMES P  
MCCLASKEY, CHARLES R  
MCCULLOUGH, RUSSELL L  
MICELLI, FRANCESCO  
MLAKAR, PAUL  
MOBASHER, BARZIN  
MOCKAPETRIS, JOSEPH  
MOSALAM, KHALID  
MUNOZ, PEDRO R  
MUTSUYOSHI, HIROSHI  
MYERS, JOHN

NAGUIB WASSIM  
NAHLAWI, KHALED  
NATARAJAN, NANDAKUMAR  
O'NEIL, EDWARD F  
PANTELIDES, CHRIS P  
PARETTI, RENATO  
PARZYCH, JEFFREY G  
PAUER, RICHARD JOSEPH  
PESSIKI, STEPHEN  
PETRINA, PETRU  
PHOENIX, S LEIGH  
PINCHEIRA, JOSE A  
RAHMAN, A HABIB  
RAMAKRISHNAN,  
VENKATASWAMY  
RAMIREZ, GUILLERMO  
REDA TAHA, MAHMOUD  
REDDY, D V  
RIZK, TAREK N  
ROLL, RICHARD D  
SAADATMANESH, HAMID  
SAAFI, MOHAMED  
SCHERER, JOSEF M  
SCOTT, RICHARD H  
SHAHROOZ, BAHRAM M  
SHEHATA, EMILE F  
SHEHATA, IBRAIM ABD EL MALIK  
SINGH, SHAMSHER  
SOROUSHIAN, PARVIZ  
SPEAKMAN, JIM D  
STEERE, SAM  
TAN, KIANG-HWEE  
THIPPESWAMY, HEMANTH K  
TRIANAFILLOU, THANASIS C  
TUMIALAN, JAIME  
UTHOFF, STEVE C.  
VIJAY, P.V.  
VINCENT, JOHN F  
WALDEN, LEE  
WALKUP, STEPHANIE L  
WATSON, RONALD J  
WERNLI, MARKUS  
WU, ZHISHEN  
ZELLERS, ROBERT C  
ZIEHL, PAUL  
ZOU, PATRICK X

## Attachment 4 - Subcommittee Agenda's

### AGENDA – ACI 440-C State-Of-The-Art

Tuesday, April 1, 2003

10:00 am - 12:00 pm

Fairmont Hotel - Tweedsmuir Room

1. Attendees self-introduction
  2. Approval of agenda
  3. Approval of last meeting minutes (Phoenix, Oct 27, 2002)
  4. Discussion of the current status of the state-of-the-art report
  5. Timeline for ballot submission
  6. Editorial Committee (Sen, Brena, Gupta, Marsh, and Neale)
  7. New Business
  8. Adjournment
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### AGENDA - ACI 440-D Research

Monday, March 31, 2003

1:00 – 2:30 pm

Fairmont Hotel - Boardroom

1. Introductions of those in attendance
2. Approval of Agenda
3. Approval of previous minutes (see attachment A)
4. *Concrete International* article on research survey results (see attachment B)

#### OLD BUSINESS

5. Research Needs – Workshop Proposal (see attachment C)
6. Sources of Funding

#### NEW BUSINESS

7. Adjourn
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### AGENDA – ACI 440-E Professional Education

Tuesday, April 1, 2003

11:30 am – 1:00 pm

Fairmont Hotel – Gabriola Room

1. Call Meeting to Order
2. Self-Introduction
3. Approval of Agenda
4. Approval of Minutes from last meeting
5. Presentations
  - a) Guide for the Design and Construction of Concrete Reinforced with FRP Rebars
  - b) Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures
6. Additional Presentations of 440 documents
7. New Business
8. Closing Comments
9. Adjourn

## **Attachment 4 - Subcommittee Agenda's continued**

### **AGENDA – ACI 440-F Repair**

**Monday, March 31, 2003,**

**8:30 am -12:00 pm**

**Fairmont Hotel – Waddington Room**

1. Call Meeting to Order
2. Self Introductions
3. Approval of Agenda
4. Approval of Minutes from Last Meeting
5. Review of NSM Task Group Report
6. Subcommittee Task Group Reports (G. Blaszak)
  - Adhesives (G. Brown)
  - Others
7. New Business
8. Closing Comments
9. Adjourn

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### **AGENDA – ACI 440-G Student Education**

**Monday, March 31, 2003**

**2:30 - 3:30 pm**

**Fairmont Hotel – Boardroom**

1. Call to order
2. Approval of minutes from October 28, 2002 meeting in Phoenix
3. Recap of 2003 competition in Vancouver
4. Preparation of Vancouver competition report for corporate sponsors
5. Rules changes/schedule for next competition
6. Status of FRP course material
7. Status of FRP design competition
8. Other business
9. Adjourn

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### **AGENDA – ACI 440-H Reinforced Concrete**

**Sunday, March 30, 2003**

**8:30 am – 12 pm**

**Fairmont Hotel – Saturna Room**

1. Call the meeting to order
2. Attendees' introduction (name, affiliation and membership) (update attached list)
3. Approval of and changes to agenda
4. Approval of the last meeting minutes (see attachment)
5. Subcommittee reports
  - (a) Status of changes to 440.1R-01 – Lead: Nanni
  - (b) Bond & Development Length – Lead: Shield
  - (c) Compression Behavior – Lead Mirmiran
  - (d) Deflection & Serviceability – Lead: Gross
  - (e) Grids – Lead: G. Brown
  - (f) Knock-Down Factors – Lead: Greenwood
  - (g) Secondary Reinforcement – Lead: Bradberry
  - (h) Shear Capacity - Lead: Frosch
6. Other activities
7. New business – TBD
8. Open discussion
9. Adjourn

## **Attachment 4 - Subcommittee Agenda's continued**

### **AGENDA – ACI 440-I Prestressed Concrete**

**Sunday, March 30, 2003**

**2:00 – 4:30 pm**

**Fairmont Hotel – Saturna Room**

1. Call to order, introductions, announcements, sign roster
2. Appoint a Secretary
3. Changes to the Agenda
4. Minutes from previous meeting
5. Committee document
6. Review of ballots
7. New business
8. Adjourn

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### **AGENDA – ACI 440-J Stay-In-Place Formwork**

**Tuesday, April 1, 2003**

**8:30 – 10:00 am**

**Fairmont Hotel – Tweedsmuir Room**

1. Call the meeting to order
2. Attendees self introduction
3. Approval of the agenda
4. Approval of the minutes of the last meeting
5. State-of-the-Art Chapter for 440C
6. Design Guide and Specifications
7. Other business
8. Adjourn

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### **AGENDA – ACI 440-K Material Characterization**

**Monday, March 31, 2003**

**3:30 am -6:30 pm**

**Fairmont Hotel – Waddington Room**

1. Call to order
2. Introductions
3. Review of agenda
4. Approval of Minutes
5. Ballot
6. Schedule for going Forward
7. Adjournment

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### **AGENDA – ACI 440-L Durability of FRP Concrete Structures**

**Sunday, March 30, 2003**

**12:00 – 2:00 pm**

**Fairmont Hotel – Saturna Room**

1. Call to order
2. Introductions
3. Approval of agenda
4. Collection of comments on current Draft 440L document
5. Schedule of document completion
6. Adjourn

## **Attachment 4 - Subcommittee Agenda's continued**

### **AGENDA – ACI 440-M Repair of Masonry Structures**

**Tuesday, April 1, 2003**

**8:00 - 10:00 am**

**Fairmont Hotel - Boardroom**

1. Attendees self-introduction
2. Approval of agenda
3. Approval of last meeting minutes (Phoenix, October 29, 2003)
4. Discussion on ACI 440C: Chapter 10 – Masonry
5. Discussion on the ACI 440M State-of-the-Art-Report
6. Contributions to the report
7. New business
8. Adjournment