

**ACI-ASCE Committee 445—*Shear and Torsion***  
**Fall 2011 Meeting Minutes**  
**2:00 p.m.–6:00 p.m., Monday, October 16-20, 2011**  
**Millennium Hotel and Duke Energy Convention Center, Cincinnati, Ohio—Meeting Room C-231**

**1. Welcome, Introductions, General Announcements, Agenda (Kuchma)**

Voting members present (17): Dan Kuchma (Chair), Gary Greene (Secretary), Mark Ascheim, Neal Anderson, Robert Barnes, Oguzhan Bayrak, Abdeldjelil Belarbi, Evan Bentz, John Bonacci, Michael Brown, Neil Hawkins, Gary Klein, Adolfo Matamoros, Lawrence Novak, Carlos Ospina, Karl-Heinz Reineck, David Sanders

Voting members not present (19): Perry Adebar, Robert Anderson, Zdenek Bažant (informed), Hakim Bouadi, Michael Collins, David Darwin, Walter Dilger, Marc Eberhard, Catherine French, Robert Frosch, Tom Hsu, Zhongguo “John” Ma, Denis Mitchell, Y.L. Mo, Stavoula Pantazopoulou, Maria Polak, Julio Ramirez (informed), Raj Valluvan (informed), James Wight

Associate members present (9): Neil Hammill, Matthew Huizinga, Dan Reider, Mehrdad Sasani, Tom Schaeffer, Lesley Sneed, Susanto Teng, Robin Tuchscherer, Qiang Yu

Visitors (7): Mark Carkrov, Daniel Dunkelberg, Amin Ghali, Eva Lantsoght, Bahram Shahrooz, Hitoshi Shiohana, Konrad Zilch,

Chairman Kuchma called the meeting to order. Attendees introduced themselves.

Kuchma reviewed the planned order of agenda items. The agenda is attached to these minutes. Sanders asked that discussion of the session at the 2012 Structures Congress be added to the agenda. The resulting discussion is summarized with Item 7 below.

**2. Approval of Minutes of Spring 2011 ACI-ASCE 445 Meeting held in Tampa Bay (Kuchma)**

The minutes for the previous meeting were approved (Klein, Bentz).

**3. ACI 318-E Actions (Kuchma for Wood)**

Subcommittee 318E continues to make good progress towards the reorganization of the ACI 318 Building Code. .

**4. Subcommittee Reports**

**a) 445-A Strut and Tie (Bayrak)**

Bayrak reported that the subcommittee is finalizing an outline for the new document titled, “Design Guidelines for Strut and Tie Method.” Proposed topics in the new document include: design procedure, modeling and design considerations, serviceability considerations, implementation of STM design and construction details, and other design specifications using STM. The document would be based on the ACI 318-11 code. Bayrak stated that the chapter authors are working to complete an extended chapter outline by the end of January 2012.

The subsequent discussion included the following:

ACI 318 is moving the STM provisions into the main body of the code and the special publication will provide an explanation of the method for students and designers.

The new document should reference ACI 318-14 because the code language should be done by 2013. Also, a discussion of curved bar nodes will be included in the new document. Curved bar nodes will be in the ACI 318-14 but are not currently in ACI 318-11.

b) **445-B Seismic Shear** (Pujol)

Pujol reported that they are working on a document titled, “Structure Wall Performance Database: Data Schema”. They are working to identify the important fields (columns of data) in the database now, because adding data fields at a later date would require them to update previously entered tests with this data.

The current version of the database is hosted at NEES.org. The database provides information about the test specimens, material properties, and test results. Data from a few hundred tests have been entered into the database; however some detailed information, such as reinforcement locations, was not originally entered. Pujol asked for four people to volunteer to enter detailed information such as reinforcement location into the database.

The subsequent discussion included the following:

Bayrak suggested reviewing old expressions for design equations to determine which fields were needed in the database for code evaluation. Reineck encouraged Pujol to use the same conversion factors for compressive strength specimens as was used in the database of shear tests. Reineck also asked about the creation of an elimination data base and evaluation database. Pujol reiterated that the current database was a collection database and had not been filtered to eliminate tests that failed in flexure.

Regarding the detail in the database, Bentz stated that it may be difficult to include detailed information like rebar location, in the case of a complex rebar geometry. Bayrak added that many researchers may only need basic information.

Pujol restated his request for assistance to enter data into the database and for assistance to check the existing data in the database. Kuchma offered the future assistance of one of his students. Members are encouraged to directly contact Pujol if they can provide assistance.

c) **445-C Slab Shear** (Ospina)

The current version of the punching shear database is published on the NEESHub site. It is still set as a private database and includes 527 tests of isolated slabs with orthogonal reinforcement on interior columns. The committee is currently working on collected punching shear database and “derived quantities” including average reinforcement ratio and effective column dimensions. Ospina “demonstrated” the fields in the database and the sorting functionality at the NEESHub site. Ospina asked for feedback on collected database.

Ospina stated that future tasks for the subcommittee include developing a protocol for exchange of data with other groups, performing a high-level data check prior to public release, and evaluating slab failure modes to distinguish punching failures from flexural failures. Part of this is a plan to implement a deformation related criteria to confirm extensive slab deformation prior to punching.

The NEESHub site currently has password protected pdf versions of papers referenced by the database. A question was raised about who is granted permission to references on NEESHub. Opsina responded that the plan is to only allow 445 members, and that access is currently only by invitation.

d) **445-D Beam Database** (Reineck)

Reineck reminded the committee that this has been as a joint effort with DAfStB.

The subcommittee has finalized the two databases for slender beams with stirrups and without stirrups. Both databases are considered “control databases” and included tests with point loads

and distributed loads. Reineck proposed a recheck of the databases for specimens with shear failures that could actually be flexural failures.

Reineck asked for assistance with the two prestressed concrete databases: one with stirrups and one without stirrups. Work is needed to merge the three separate databases into one and to find additional data.

Reineck stated his plan to publish papers about slender RC beams in the ACI Journal and it would include publishing excel sheets containing the test data. The first paper would be an explanation of the database and the second paper would be comparisons to design expressions. These papers are expected to be completed this Autumn, but the evaluation database of RC members is ready for committee use. This would allow the evaluation of proposed code provisions. A question was asked about the completeness of the PC database. Reineck stated that only a partial list of the PC database is complete and it does not include all tests. Sanders suggested that the RC and PC data needs to be looked at holistically.

There was a short discussion about the name of the database for the slender RC members. Kutchma suggested, "ACI-ASCE 445 database."

Bayrak asked about the status of the deep beam database. Reineck responded that the non-slender cases are currently being developed. The plan is to complete this database after the RC and PC databases.

e) **445-E Torsion** (Kuchma for Belarbi)

Belarbi stated that the report is nearing completion. The comments from TAC were received two years ago and about 2/3 of the comments were editorial. There are about ten more non-editorial comments that still need to be addressed, with some of these requiring substantial changes to document. Belarbi stated that the plan is for the document to come back to 445 for re-ballot of the changes only. TAC has asked for the document to be resubmitted by the Dallas convention.

f) **Ad hoc committee on prestressed concrete shear issues** (Matamoros)

The change proposal being prepared by the subcommittee is ready for ballot. The purpose of 445 balloting the document would be to act as a feeder to 318, then 318 can proceed as they choose. Committee 423 is also balloting the document.

## 5. **Population, Validation, Maintenance, and Use of Experimental Databases (Kuchma)**

Kuchma suggested the following as topics of discussion:

- Distribution/Access-Control
- Types (collection/Control/Evaluation)
- Information included in databases
- Usage (Researchers/Code Development/Evaluation)
- Supporting Tech for supporting database
- Sanctioning

Anderson suggested making a pdf of the current database by year as a permanent record for referencing. He also suggested including an example of how to properly reference the database in a document. There was a discussion on the frequency of releasing updated databases.

Sanders suggested that people adding new tests to the database should submit the data in the correct database format so that the holders of the database would only need to check the data.

Kuchma suggested that while uniformity of material properties across different databases is important, defining other standard variables is not necessary, because it would be difficult to agree on the standard variables as a group.

Pujol suggested creating on subcommittee on guidelines for creating databases. Others suggested that established databases would set the form for future databases.

Sanders stated that he did not want a delay to the release of the databases and suggested that the people developing the databases should write down the procedure for creating the database.

Anderson suggested that the MCP could include protocol for creating databases.

Hawkins stated that there are other databases in ACI and suggested that the people involved with the 445 column database should have a discussion with other committees about their databases.

Reineck suggested that it would be good to have an international impact by using ISO notation and the Model Code, not ACI notation.

## **6. ACI 445 Committee Input into Shear Provisions of ACI 318-14 (Sanders)**

Sanders stated that the group is waiting for the beam-shear databases to be published, which is expected soon. Then different groups can begin to make comparisons between the various one-way shear design proposals for members with and without transverse reinforcement.

## **7. Technical Sessions**

Future sessions include:

ACI Spring Convention, March 18–22, 2012 (Dallas):

- *Symposium Honoring James Jirsa's Legacy in Structural Concrete: A Time to Reflect: Shear Issues*
- Prestressed piles session in Dallas 2012

ASCE/SEI Structures Congress (Chicago), March 29–31, 2012

Session proposals due by June 6, 2011. Each session will be 90 minutes long. More details available at the Congress website:

<http://content.asce.org/conferences/structures2012/index.html>

How Digital Databases Are Changing the Ways in which Engineers do Research and Write Codes, ASCE/SEI Structures Congress, March 29 -31, 2012 at the Fairmont Chicago Millennium Park in Chicago, Illinois (Update by Pujol)

Kuchma suggested a session on punching shear for the SEI structures concrete 2013 in Pittsburg

Proposals for technical sessions at future ACI conventions are welcome. Future convention dates/locations:

Fall 2012 (Toronto), October 21–25

Spring 2013 (Minneapolis), April 14–17

Fall 2013 (Phoenix), October 20–24

Spring 2014 (Reno), March 23–27

## 8. Technical Presentations

*“Effect of Shear Stud Layout on Punching Shear Behavior of Slab-Column Connections”*, Gustavo Parra-Montesinos, University of Michigan

- Described punching shear tests at the MAST lab
- Square specimens had shear studs
- Unexpected failure in punching shear before yielding
- While a full report on the tests is not available, Parra-Montesinos offered to provide data to committee 445 upon their request

Discussion of Gustavo’s work presented to ACI 318-E in 2009 by Amin Ghali at the University of Calgary.

- Disagreed with the results of the previous research: expressed concern about the small size of column used in the tests, assessment of the failure mode
- Suggested that the specimen design did not conform to ACI 318 code

There was additional discussion from members of Committee 445

*“Continuous Stirrups for Shear and Torsion Reinforcement in Beams”*, Bahram Shahrooz, University of Cincinnati

- Presented planned research involving: examination of bond of “dog legs”, shear, and torsion in continuous stirrups

## 9. Adjournment

Meeting adjourned at 5:53 p.m. (Anderson)

Minutes submitted by Gary Greene on January 11, 2012.

### Attachments to Minutes:

- 1) AGENDA – FALL 2011 MEETING Joint ASCE/ACI Committee 445 – SHEAR AND TORSION CINCINNATI, OHIO