

**ACI COMMITTEE 336
FOOTING, MATS AND DRILLED PIERS**

Convention: Fall 2011
Location: Cincinnati, OH (M-Pavilion B)
Date of Meeting: Sunday, October 16
Time of Meeting: 1:00 – 5:00 p.m.

Participants: *Committee members present:*

<i>Voting:</i>	Bernie Hertlein
Bill Brant	Billy Oliver
Jason Draper	Adam Ramme
Rudy Frizzi	Larry Schulze
	Ed Ulrich

Associate:
David Hartman
Luke Schuler

Visitors present:

Regrets received from:

Meeting called to order at 1:10 p.m.

1. Introductions

1.1. Chair requests that guests sign in.

2. Administrative Items

2.1. Additions and changes to agenda

2.1.1. Agenda posted to website immediately prior to meeting; reviewed on screen.

2.1.2. **Motion:** Approve agenda, B. Hertlein; **Second:** R. Frizzi; **Vote:** unanimously approved.

2.2. Meeting will adjourn at or before 5:00 p.m.

3. Approval of Minutes

3.1. Spring 2010, Chicago, IL

3.1.1. Reviewed minutes on screen, made correction to spelling of L. Schuler's name

3.1.2. **Motion:** approve, L. Schulze; **Second:** R. Frizzi; **Vote:** unanimously approved.

3.2. Fall 2010, Pittsburgh, PA

3.2.1. Reviewed minutes on screen, made correction to spelling of L. Schuler's name

3.2.2. **Motion:** approve, B. Brant; **Second:** L. Schulze; **Vote:** unanimously approved.

3.3. Spring 2011, Tampa, FL

3.3.1. Reviewed minutes on screen.

3.3.2. **Motion:** approve, R. Frizzi; **Second:** J. Draper; **Vote:** unanimously approved.

4. Membership Roster Update

4.1. Current roster

4.1.1. The current roster from the committee website was presented on screen. There are 16 voting members; 40% is a quorum = 7 members required to hold votes on documents; 50% = 8 required to vote on other actions (sessions, SPs, etc.). There are 15 consulting/associate members.

4.1.2. Updates/corrections to contact information can be made by individual members online and now photos can be uploaded. [Members are encouraged to take advantage of this new feature and upload a suitable business photo.](#)

4.2. Changes to current membership categories

4.2.1. Luke Schuler to be changed to voting member. [B. Oliver to request the change through ACI staff.](#)

4.2.2. [Chair to inquire regarding membership status with D. Campione, H. Sandberg, Johnny Kwok.](#)

4.2.3. David Hartmann requests change to voting status. [B. Oliver to request the change through ACI staff.](#)

5. Status of Current Documents

5.1. 336.1 – Specification for Drilled Piers

Published 2001.

5.1.1. Revision task group report (Billy Oliver)

- Subcommittee of three is working on technical changes first, then formatting.
- A. Ramme delivered proposed revisions; other subcommittee members (B. Oliver, L. Schuler) need to review.
- Discussion: develop revision as a reference specification or as a guide to writing a specification?

The document currently exists – and gets used as – a reference specification.

A guide would require much more input from designers; one risk is that the specification produced by less experienced designers may be incomplete and/or have erroneous, conflicting, or impractical requirements.

A reference specification often does not get reviewed properly by the designer, and does not lend itself well to modification by a knowledgeable designer. The project-specific issues are often the ones that cause problems, so a guide may result in fewer issues during construction.

Motion: to develop and submit for approval a revised version of 336.1 as an ACI Reference Specification (not a guide report) meeting the latest ACI format, which will virtually eliminate commentary from the document, but will allow the specification to be referenced into project specifications, L. Schulze; **Second:** E. Ulrich; **Vote:** unanimously approved.

Motion: Develop a guide to writing/customizing a specification for drilled shafts (e.g. report, a special publication, a TechNote, or even just a CI article – this decision will be made in the future based on the proposed content generated by the revisions to the specification), J. Draper; **Second:** B. Hertlein; **Vote:** unanimously approved but A. Ramme, who abstained.

The 336.1 revision subcommittee will make notes as they revise the specification, and then bring the results to the full committee for discussion and a decision on what type of publication seems most appropriate for the content developed to date.

5.2. 336.2R – Suggested Analysis and Design Procedures for Combined Footings and Mats Published 1988, reapproved 1993.

5.2.1. Piled Rafts Subcommittee report

5.2.1.1. Three approaches in use versus one recommendation.

5.2.1.2. E. Ulrich feels strongly that the document should provide one recommended procedure for design. Subcommittee needs to decide general direction for this chapter.

5.3. 336.3R – Design and Construction of Drilled Piers

Published 1993, reapproved 2006, under revision.

5.3.1. TAC submission schedule and strategy

5.3.1.1. Chair requests assistance with the last few items on the submission checklist.

– D. Hartmann has the resources to redraw the figures in CAD; he volunteered to do so. Target date: 31 January 2012.

– L. Schulze volunteered to go through the document and assess the revisions required by inserting units (customary and metric), including changes to equations.

If there are many changes required, R. Frizzi, B. Oliver, and J. Draper will assist.

B. Brant will check the unit conversions after they are complete. Target date: 31 January 2012.

5.4. 336.4R – Alternative Method for the Analysis and Design of Footings using Load and Resistance Factors

Draft document, never published.

5.4.1. On hold pending revision of 336.2R.

5.4.2. Future action

5.4.2.1. Consider technical session on LRFD of foundations. General interest topic, some passionate discussion on this committee and ASCE Retaining Walls committee. AASHTO mandatory documents in place for federally funded projects. Session would probably need to focus on casually interested audience members and pros/cons, rather than detailed topics.

6. TAC Updates

6.1. TAC review of 336.3R

6.1.1. Three volunteers: Billy Oliver, Bernie Hertlein, Clyde Baker

- 6.1.2. Timing of remaining edits (target completion date 31 January 2012) will likely result in need to attend summer meeting in Gleneden Beach, OR (10-13 July 2012); submission to ACI Staff deadline is 06 March 2011.

7. Review of Action Item list

- 7.1. See revised list, attached and posted on website.

8. Working Session: 336.2R

8.1. 336.2R – Suggested Analysis and Design Procedures for Combined Footings and Mats

- 8.1.1. It would be useful to set up an official subcommittee to provide access to uploading for B. Brant and recognition for subcommittee members on the document title page. [B. Oliver to request through ACI Staff.](#)
- [B. Oliver to move draft chapters to subcommittee site.](#)
 - Discussion: Ballot outline and Chapter 1; additional chapters ready? Yes, Chapter 3 is ready and will be included. [B. Oliver to ballot outline, Chapter 1 and Chapter 3.](#)
- 8.1.2. Chapter by chapter report
- 8.1.2.1. Chapter 1 General – ready to ballot.
- 8.1.2.2. Chapter 2 Notations and Definitions – generated from existing document in accordance with style guide.
- 8.1.2.3. Chapter 3 Loads – ready to ballot.
- 8.1.2.4. Chapter 4 Soil-Structure Interaction – derive from SP152-03 and other sources.
- 8.1.2.5. Chapter 5 Design Considerations – no update, but may include ‘leftovers’ from other chapter edits.
- 8.1.2.6. Chapter 6 Rigid Foundation Analysis – updated version posted; consider inclusion of additional information on method of strips (6.4), reference Fritz Kramrisch.
- 8.1.2.7. Chapter 7 Flexible Foundations – rearranged outline to reflect drafting in progress.
- 8.1.2.8. Chapter 8 Deep Foundation Supported Mats – subcommittee has made drafting progress, but decision is needed on three concepts versus one recommended approach/procedure.
- 8.1.2.9. Chapter 9 Construction Considerations – literature search hasn’t yielded much consensus; ideas:
- pour logistics, pour sequence, joint placement
 - see draft 336.4R for section 2.8 titled “Construction Means and Methods”
 - construction joints” (posted on website)
 - ACI 351.2R-10 Report on Foundations for Static Equipment has a similar chapter
 - past experiences, made positive/preventative
- 8.1.2.10. Chapter 10 Summary – write after the bulk of the document is complete.
- 8.1.3. Proposed teleconference for ~31 January 2011 to report on chapter progress and discuss and reorganization needed.

9. Open Discussion of Current Issues in Construction (Footings, Mats, or Drilled Piers)

A. Ramme asked about potential practices for investigation of as-installed drilled piers with quality concerns. Committee discussed installation of cross-hole sonic logging (CSL) tubes in drilled shafts and the relative merits of installing tubes in all shafts.

Several DOTs require installation of tubes, but not all. Tube material costs, but the significant cost is installation.

B. Hertlein noted that the cost of repairing one pier will justify the expense of installing tubes in many, many piers.

E. Ulrich noted that NDE methods are not always conclusive, and are no substitute for a qualified contractor with proper oversight.

10. Future Agenda Items

Committee members are encouraged to send suggestions to B. Oliver for inclusion on future agendas.

11. Adjourn

Motion: adjourn, B. Hertlein; **Second:** B. Brant; **Vote:** unanimously approved.

The meeting was adjourned at 4:45 p.m.

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<u>Item No.</u>	<u>Date Added</u>	<u>Target Date</u>	<u>Person(s)</u>	<u>Brief Description of Assignment</u>	<u>Status of Action Item</u>
1	3/2010	<u>Per TAC July 10-13, 2012</u>	C. Baker B. Hertlein B. Oliver	Attend TAC meeting for review of 336.3R. <u>Timing of remaining edits (target completion date 31 January 2012) will likely result in need to attend summer meeting in Gleneden Beach, OR (10-13 July 2012); submission to ACI Staff deadline is 06 March 2011.</u>	Open
2		<u>10/2010 2/2012</u>	B. Oliver	Communicate changes to tolerances in current draft of 336.3R to committee 117 >>B. Oliver attended the 117 meeting on 04 April in Tampa, FL. 117 will happily incorporate revised tolerances. 336 to provide revised, rationalized tolerances to 117 during revision of 336.1.	Open
3	3/2010	<u>12/2010 01/2012</u>	B. Oliver <u>D. Hartmann</u> <u>L. Schulze</u>	Document balloting of 336.3R, clean up text, and submit to ACI. >> balloting summary confirmed >> corrected "forbidden phrases" <u>>> corrected table of contents</u> <u>>> corrected equation and table cross-references</u> <u>Need units, figures, references.</u>	In progress
4	3/2010	<u>12/2010 10/2011</u>	B. Oliver	Ballot 336.2R revised outline, and Chapter 1, <u>and Chapter 3</u>	Open
5	3/2010	<u>3/2011 12/2011</u>	R. Frizzi	Form subcommittee on piled rafts >> complete; members are Rudy Frizzi, Clyde Baker, Harry Poulos, Rolf Katzenbach, Ed Ulrich and Billy Oliver Draft piled rafts chapter for 336.2R. >> in progress; outline/revised draft complete, waiting for subcommittee comments, detailed draft to follow. <u>>> Detailed draft circulating for subcommittee comments; discussion of three possible approaches versus a single recommended approach</u>	In progress
6	04/2011	05/2011	ALL	Review revised outline for 336.2R and provide comments prior to 15 April. >> none received.	Closed
7	04/2011	05/2011	B. Oliver	Request Larry Schulze be changed from Associate member to Voting member.	Closed

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8	04/2011	05/2011 11/2011	B. Oliver	Draft letter to IBC on proposed changes/corrections; contact Dan Falconer about sending the letter; send draft copy Larry Johnsen, DFI and Antonio Marinucci, ADSC.	Open
9	04/2011	05/2011 11/2011	B. Oliver	Ballot letter to IBC on proposed changes/corrections.	Open
10	04/2011	05/2011	B. Oliver	Ballot decision to revise 336.1 as a reference specification versus a guide to writing a specification. >> Balloted in Cincinnati meeting; reference specification, consider future companion guide-type document.	Closed
11	3/2010	6/2011 12/2011	B. Oliver <u>A. Ramme</u>	Organize 336.1 revision subcommittee; prepare 1 st draft for committee review >> members: Billy Oliver, Adam Ramme, Luke Schuler >> <u>Proposed revisions added to draft.</u> <u>Arrange subcommittee teleconference in late November to review.</u>	In progress
12	04/2011	10/2011	B. Oliver	Verify ACI philosophy on specific date/editions versus evergreen references. See TCM 2011, 5.4.3: "A reference to a standard should include only its serial designation and not its title or date."	Closed
13	10/2011	10/2011	B. Oliver	Post 336.1 draft on committee website.	Open
14	10/2011	12/2011	B. Oliver	Post updated 336.2R outline, draft chapters, & references on committee website.	Closed
15	10/2011	12/2011	B. Oliver	Request 336.2R subcommittee through ACI Staff; move draft chapters to subcommittee site.	Open
16	10/2011	01/2012	B. Brant	Organize teleconference meeting for 336.2R revision subcommittee near the end of January 2012.	Open
17	10/2011	01/2012	D. Hartmann	Redraw the figures from 336.3R in CAD.	Open

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18	10/2011	01/2012	L. Schulze	Review 336.3R to assess the revisions required by inserting units (customary and metric), including changes to equations. Make changes or divide and assign some to R. Frizzi and J. Draper.	Open
19	10/2010	1/2012	R. Frizzi	Organize session and special publication on mats supported by deep foundations/combined foundation designs.	Open
20	10/2011	04/2012	ALL	Post a suitable business photo on the ACI website under your profile information.	Open