ACI COMMITTEE 336
FOOTING, MATS AND DRILLED PIERS
Fall 2008 CONVENTION – St. Louis, MO
Sunday, November 2, 2008
1:00 – 5:00 P.M.
Renaissance Grand – R-Shaw

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1. **Introductions**
   1.1. Sign-in sheet
   1.2. Request that guests sign in

2. **Administrative Items**
   2.1. Additions or changes to agenda?

3. **Approval of Minutes**
   3.1. Fall 2006, Denver, CO
      3.1.1. Ballot did not meet ½ rule (see below)
      3.1.2. Vote
   3.2. Spring 2007, Atlanta, GA
      3.2.1. Resolve negative: "B. Oliver named chair"
      3.2.2. Ballot did not meet ½ rule
      3.2.3. Vote
   3.3. Fall 2007, Fajardo, PR
      3.3.1. Ballot did not meet ½ rule
      3.3.2. Vote
   3.4. Spring 2008, Los Angeles, CA
      3.4.1. Minutes posted to website 04/08/2008
      3.4.2. Review minutes onscreen
      3.4.3. Vote
   3.5. Voting summary

http://www.concrete.org/COMMITTEES/Ballots_Closed.asp?Committee_Code=0000336-00&BallotID=1796

Ballot Items:

Item #	Item Description
1	Denver 2006 The previous ballot received a negative vote. The attached version has been revised accordingly. Attached File: ACI 336 Minutes - Denver 2006 r1_ballot
2	Atlanta 2007 Attached File: ACI 336 Minutes - Atlanta 2007_ballot
3	Puerto Rico 2007 Attached File: ACI 336 Minutes - Puerto Rico 2007_ballot

Preliminary Voting Summary:

There are 22 committee members eligible to vote.

Passage of an item requires resolution of any negative votes. Passage of an item also requires that the number of affirmative votes be at least that given by the 1/2 and 2/3 rules. Please refer to the ACI Technical Committee Manual for additional information on balloting procedures.

Item #	Affirmative	Affirmative with Comments	Negative	Abstain	Not Returned	The 1/2 Rule	The 2/3 Rule
1	6			4	12	Item Does Not Meet	Item Meets
2	6		1	3	12	Item Does Not Meet	Item Meets
3	7			3	12	Item Does Not Meet	Item Meets

4. Membership Roster Update

4.1. Current roster

4.1.1. Updates/corrections available online

4.1.2. Changes to current membership categories

4.2. Membership questionnaire

4.2.1. Results

4.2.2. Next steps

4.3. Prospective new members

5. Status of Current Documents

5.1. 336.1R – Specification for Drilled Piers

5.1.1. Committee agreed to postpone revision until revision of 336.3R is approved.

5.2. 336.2R – Suggested Analysis and Design Procedures for Combined Footings and Mats

5.2.1. TAC requested formal committee response: revise or remove from MCP?

5.2.1.1. Voting summary:

02/01/2008 ballot

There are 22 committee members eligible to vote.

Passage of an item requires resolution of any negative votes. Passage of an item also requires that the number of affirmative votes be at least that given by the 1/2 and 2/3 rules.

Item #	Affirmative	Affirmative with Comments	Negative	Abstain	Not Returned	The 1/2 Rule	The 2/3 Rule
1	7	1		2	12	Item Does Not Meet	Item Meets

5.2.2. B. Brant volunteered to work on revision. Progress?

5.3. 336.3R – Design and Construction of Drilled Piers

5.3.1. New draft uploaded 03/30/2008

5.3.2. Numerous editorial & minor changes (B. Oliver, R. Frizzi)

5.3.3. Discussion session is Agenda item 8.

5.3.4. Balloting strategy suggestions?

5.4. 336.4R – Alternative Method for the Analysis and Design of Footings using Load and Resistance Factors
5.4.1. Significant interest in industry, on committee
5.4.2. Need to focus resources on 336.2R first, then same subcommittee should pick up .4R

6. TAC Updates

Activity	TAC Spring Meeting San Antonio, TX March 15-19, 2009	TAC Summer Meeting Myrtle Beach, SC July 15-17, 2009
Final 30-day letter ballot issued	November 7, 2008	March 11, 2009
Committee-approved document submitted to staff for editorial review*	December 12 , 2008	April 15, 2009
Document submitted to TAC and external reviewers	February 6, 2009	June 10, 2009
TAC Review Group conference calls	March 3-5, 2009	July 8-10, 2009
TAC meeting**	March 13-15, 2009	July 15-17, 2009

7. Future joint technical session with 543 or ASCE?

8. Discussion Session: 336.3R

The numbering used below corresponds to the section numbers in the draft of 336.3R-xx.

Synopsis

The drilled pier design procedure includes: (1) determination of overall pier size using service loads and allowable resistances, and (2) design using factored load combinations. Emphasis is on the former, which involves interaction between the earth and pier.

Do we need to re-visit this in light of current ground-to-pier design procedures using LRFD?
Recommendation: Include both methods in the document, simultaneously. Volunteers?

1.2 Notations

K_2 = constant, dimension to be selected in each individual case so that the dimension of k_s, becomes L^{-3}

Recommendation: Remove any variables which are not used in the document or figures.

1.4 Definitions

Construction manager: The person, firm, or corporation with whom the owner enters into an agreement to act in the owner's behalf during construction.

Recommendation: Remove any words which are not used in the document or figures.

Recommendation: remove definitions for words only used once; define them in context as required.

Recommendation: replace “soil”, “soil and rock”, “(soil and rock)” with “earth”; add definition of earth to section 1.4:

> *Earth:* Geotechnical subgrade material; includes soil, rock, and intermediate geotechnical materials such as weathered rock and cemented soils.

General

Recommendation: be consistent in the use of an introductory sentence following a subchapter (0.0) prior to any subheadings (0.0.0). (Example: 3.4-Vertical load capacity, followed immediately by 3.4.1.)

2.5.7 Axial load tests

Is there an issue with describing O-cell or Statnamic testing in generic terms? Is there a reason to use the trade names?

Recommendation:

> …For large projects or in cases of uncertainty, load tests are desirable. Reaction can be provided by belled or socketed piers designed for tension and positioned around the drilled pier to be compression tested. The reaction piers transfer load through a reaction frame and jacks positioned above the test pier.
>
> Heavily loaded drilled piers are often testing using other methods. One such method, developed by J. Osterberg, consists of installing an embedded instrumented loading jack capable of applying a load in excess of the pier’s maximum design load within a full-scale test pier. Both end bearing and side resistance are tested. The maximum test load is defined by failure in either side resistance or end bearing. If the maximum side resistance is exceeded, the test can be extended further conventionally with a surface reaction frame and dead weights or anchor piers to permit applying higher end bearing load. Another common test method accelerates an independent reaction mass upward using pressure contained in a chamber; the resulting reaction is applied to the pier. Load tests may also be performed on small diameter, instrumented, drilled piers; however, care must be exercised in extrapolating the results to larger diameter piers.

2.3.3 Construction engineering and quality control

> 2.3.3 Construction engineering and quality control— Construction engineering should be performed to confirm the validity of simplifying assumptions made in the design. The scope and method of observation, obtainable tolerances, and quality control influence the refinement to which the design can reasonably be carried. Conversely, allowable tolerances may determine construction methods, scope of geotechnical construction engineering, observation, and quality control.

Ambiguous?

Recommendation: Accept as-is.

3.1.1 Axial loads

> DL = dead loads from the supported structure and weight of the pier, less weight of material displaced by the pier (net weight of the pier)
>
> Dg = dead loads from the supported structure and weight of the pier (gross weight of the pier).
>
> & etc.

There are ten variable definitions given here. Should we define variables in the text, or only in the notation section of Chapter 2 at the beginning of the document?

Recommendation: Accept as-is.

3.6 Piers socketed in rock
Should this section cover IGM?
Recommendation: IGM deserves special attention for sampling techniques, etc., but does it need particular mention here? If so, please provide suggested text.

4.4.5 Concreting methods
We need to clarify and agree on:
Minimum tube diameters
Use of 'rat holes'
Recommendation:
Minimum tremie and pump tube ID diameters should be:
Tremie: 10 inches
Pump Tube: 5 inches
All tremies should be maintained clean and smooth on the interior. The exterior should be as smooth as practical and free from materials that might contaminate the slurry. The latter can be accomplished by rinsing the tremie before lowering it into the slurry, or by storing the tremie in a hole filled with slurry.

5.5 Concrete placement
This section appears to have been taken largely from a document about piles.
Is it generally applicable to piers?
Does the committee feel it presents needed information?
Is a grout "precharge" common practice for drilled piers >30inches in diameter?

5.8 Criteria for acceptance
Should this section be expanded to include additional discussion of NDT and load testing (including Osterberg cells)?
Recommendation: Include a few sentences, but direct the reader to the appropriate document(s):
DFI Drilled Shaft Committee and DFI Testing and Evaluation Committee, 2005, "Manual for Non Destructive Testing and Evaluation of Drilled Shafts," Deep Foundations Institute, 88 pp.

Baker, C. N. and Hertlein, B., 1995, "Practical Experience with Non-Destructive Testing of Deep Foundations: A Caisson Inspector's Guide to Detecting Anomalies and Assessing the Significance of "Defects"," 17pp.

5.8.1 Location and plumbness
ACI 117-06 Section 3 and its commentary give several tolerances; the requirements of 336.1 are shown in brackets []:
3.1-Deviation from plumb
3.1.3 Category C–For reinforced concrete piers–+/-2.0% of shaft length.[1.5% and/or 1/24 of specified shaft diameter]<<note: per the commentary, this is the excavated hole>>
3.2.3 Top of drilled piers
Horizontal deviation of the as-cast center shall be the lesser of 4.2% of the shaft diameter or +-3in. (76mm). [1.5% and/or 1/24 of specified shaft diameter]
3.3.2 Top surface of drilled piers

Vertical deviation….+1 in. (25mm)
……..-3 in. (76mm) [not specified, but +/-0.5 inch for anchorage components]
3.4.1 Base of bell pier
The lesser of 10% of the bell diameter or +/-3 in. (76 mm).[1/12]

Recommendation: Accept 117's recommendations; refer to 117 in our documents (both 336.1 and 336.3R). Otherwise, specify better values for all of the same tolerances in 336.1 and refer to it in 336.3R.

Editorial Changes (to be made prior to next ballot)

- Update section numbering to comply with Style Manual:
  - **Chapter 1—Introduction and Scope**
    - 1.1—Introduction
    - 1.2—Scope
  - **Chapter 2—Notation and Definitions**
    - 2.1—Notation
    - 2.2—Definitions
    - 2.3—Acronyms (if applicable)

  …remaining chapters will be renumbered accordingly.
- Verify or correct all Figure, Table, Section, and Equation references.
- Figure list in cover letter

  When retrieving artwork from a previous version of the document or from another committee document, indicate in the submittal cover letter where each figure exists. Also indicate both the original number and new number.

9. Future Agenda Items

10. Adjourn