



2009 USSD Conference

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This Checklist is to be completed by the Senior Author and returned immediately to:

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GUIDELINES FOR PREPARING USSD DRAFT AND FINAL MANUSCRIPTS

All papers accepted for the Conference will be included in a CD to be distributed to Conference Participants.

Please prepare your paper in Microsoft Word; use the attached sample as a guide for the first page. Please do NOT use Word headers or footers for footnotes, file names, etc. USSD will use footers to paginate the final proceedings.

Instructions for submitting your **draft** and **final** versions are found at the end of these Guidelines.

FORMATTING INSTRUCTIONS

Paper Size: letter size paper (8 1/2 by 11 inches)

Margins: Top and bottom: 1.0 inches; left and right: 1.25 inches. **All** text, figures, tables and photographs **must** fit within these margins. Please reduce illustrations as needed to fit.

Font: 12 point Times New Roman for text, paper title, captions and headings. **Footnotes** should be in Times New Roman 10 point.

Align Left. Do not indent first line of paragraphs.

Single spacing with one blank line between paragraphs.

Length: Papers should be 10-15 pages, including tables and figures.

Pagination: Do **not** use page numbers, as USSD will paginate the book.

EXTENDED INSTRUCTIONS

Paper Title/Author Block: The title (please limit the title to 12 words) should be in all caps, bold and single spaced, 12 point Times New Roman. Place one blank line following the paper title before listing the authors. For one to five authors, center author's names, one name per line. For six or more authors type them flush left and flush right. For an odd number of authors, center the last author under the others. Place one blank line after authors' names, before the Abstract. Please see sample page for example. Use of professional titles is optional.

Author Information — a **footnote** reference stating present position, employer, address and e-mail must appear on the bottom of the first page for each author. Use the Word footnote function — go to Insert, then Reference and Footnote.

Abstract — Paper should begin with an Abstract of no more than 250 words. Use first degree heading **ABSTRACT**. The Abstract should reflect the information actually included in the paper; this is not necessarily the abstract submitted in response to the Call for Papers. The Abstract should not include figures, tables or photographs.

Footnotes — A solid line separating footnotes from text should extend two inches (50 mm) from left margin.

Headers and Footers — Do not use the Word headers and footers, as these are reserved for paginating the published proceedings. As noted above, author information should be provided in **footnotes**, not footers.

References — The References section should immediately follow the text, rather than beginning on a new page. Use the first degree heading **REFERENCES**. References should be listed alphabetically by last name of the first author. Please do not indent reference text; double space between citations.

Units — Authors may select either SI or English system of units. Conversion to the other system is not recommended.

HEADINGS

Following are the formats of the three levels of headings. Note: **headings should not be numbered.**

FIRST DEGREE HEADING

Second Degree Heading

Third Degree Heading:

First Degree Headings should be in all capital letters, **bold**, centered. One blank line before and after heading. (Suggested First Degree Headings are: Abstract, Introduction, two or three major technical sections, Summary and References.)

Second Degree Headings have initial caps (title case), begin at left margin, **bold** and underlined. One blank line before and after heading.

Third Degree Headings begin at left margin, with initial caps, underlined (not bold), colon, begin text on same line (one blank line before the heading).

FIGURES, TABLES AND EQUATIONS

Figures and Photographs — All figures and photographs should be electronic images inserted into the document. They should appear within the main text as soon after the initial reference as possible. Figures and photographs may be in color. **All figures and photographs must fit within the same margins as the text.** Place the caption (12 point Times New Roman) below the illustration, centered, as follows:

Figure 4. Effect of Rainfall Intensity on Friction Factor

Tables — Should appear within the main text as soon after the initial reference as possible. **All tables must fit within the same margins as the text.** Place the caption (12 point Times New Roman) above the table, centered, as follows:

Table 4. Rainfall Intensity

Equations — Place one blank line between text and equation, and center equation on page. Number equations consecutively. Equation number should be in parentheses and flush right (ending at right margin).

SUBMITTING YOUR PAPER

DRAFT — Send by **e-mail** to stephens@ussdams.org, for forwarding to the Session Moderators for review. The reviewers will send comments directly to you by e-mail.

FINAL — **mail** the Word .doc file on a disk or CD **AND** a hard copy of the paper to USSD at the following address. Please do not send your final manuscript by e-mail. Because there are differences in computers, software and printers, what you see on your computer screen and on your printed version is not always what we see. (This can be problem for equations and graphics, especially.) Having a CD with the file and a hard copy helps us ensure that your paper appears in the Proceedings as you wish to see it.

Larry D. Stephens
U.S. Society on Dams
1616 Seventeenth Street, #483
Denver, CO 80202

Phone: 303-628-5430
Fax: 303-628-5431
E-mail: stephens@ussdams.org.

RESIDUAL SHEAR STRENGTH OF LIQUEFIED SOILS

I. M. Idriss¹
Ross W. Boulanger²

ABSTRACT

An evaluation of post-earthquake static stability for embankment dams that contain, or are founded on, soils that may liquefy requires estimating the liquefied soil's residual shear strength, S_r . Decisions regarding the need for expensive mitigation efforts, including ground improvement work, often hinge on the selected S_r values. This paper presents recommended relationships for estimating the residual shear strength ratio, S_r/σ'_{vo} , of liquefied nonplastic soils in the field based on a review of prior case history studies, laboratory testing studies, and recent findings regarding void redistribution mechanisms. The recommended relationships provide guidance regarding the unavoidable task in practice of having to extrapolate beyond the available case history data. Limitations in the state of knowledge are discussed.

INTRODUCTION

Procedures for estimating the residual shear strength, S_r , of liquefied cohesionless or nonplastic soils have evolved considerably over the past 25 years. Procedures that require laboratory testing of field samples have been developed that use samples obtained by frozen sampling techniques (e.g., Robertson et al. 2000) or samples obtained by high-quality tube sampling techniques coupled with procedures for "correcting" the shear strength for the estimated volume changes that occur during sampling and testing (e.g., Castro 1975, Castro and Poulos 1977, Poulos et al. 1985). Case history based procedures for estimating the in situ S_r of liquefied soils have been developed by back-analyses of liquefaction flow slides, as first presented by Seed (1987) and since modified by a number of investigators (e.g., Seed and Harder 1990, Ishihara 1993, Wride et al. 1999, Olson and Stark 2002).

Whitman (1985) described situations where pore water seepage driven by earthquake-induced excess pore water pressure gradients could lead to the localized loosening of the liquefied soil, or "void redistribution", that could result in S_r being much lower in the field than would be obtained from laboratory tests of samples at the pre-earthquake void ratio. These situations require the presence of a soil layer of significantly lower permeability overlying the liquefied soil layer, thereby impeding the outward seepage, as illustrated for an infinite slope in Figure 1. Physical and analytical modeling studies by Kokusho (2000), Kulasingam et al. (2004), and Malvick et al. (2004) have illustrated the void redistribution phenomena and evaluated several factors that significantly affect it.

¹ Professor Emeritus, Department of Civil & Environmental Engineering, University of California, Davis, CA 95616, imidriss@aol.com

² Professor, Department of Civil & Environmental Engineering, University of California, Davis, CA 95616, rwboulanger@ucdavis.edu