

Instrumentation

John Dunicliff

Introduction

This is the fourteenth episode of GIN. A very brief episode this time, because of overseas traveling commitments.

The ASTM Affair

I hope that you've read, and thought about, the article (on pages 31-41) in the December 1997 issue of *Geotechnical News*, "No More Judgment in Geotechnical Engineering: The Professional Legacy of ASTM?" I also hope that you've responded to the "call for action" and faxed a completed copy of the questionnaire to Allen Marr and to me. If not, please try to find motivation and time to do so. A few words to tell about your views would also be welcome. A second copy of the questionnaire is on page 30 of this issue.

I will summarize comments and results of the questionnaire in a later issue of GIN. There have been some pungent comments so far: see, for example, the following discussion by Michael Byle.

**GEOTECHNICAL
INSTRUMENTATION
FOR MONITORING
FIELD PERFORMANCE**

John Dunicliff

Instrumentation Book

John Wiley & Sons, the publisher of "*Geotechnical Instrumentation for Monitoring Field Performance*" (the Red Book), have decided not to reprint the book after the present stock is sold. This is likely to occur by the fall of 1998. After that date the book will be available from BiTech Publishers.

Two New Books

Two new books, which may be of interest to readers, have recently been published by Chapman & Hall:

- "*Monitoring of Soil-Structure Interaction: Instruments for Measuring Soil Pressures*", by George E. Lazebnik, 224 pp., ISBN 0-412-07431-1. Price \$79.95. The book describes measurement and calibration methods, discusses measurement errors, and includes chapters on full-scale field tests and case histories. In his preface the author says:

"I have...attempted to briefly describe results of some important investigations on soil/structure interaction that have been carried out in the past 30 to 40 years in the republics of the former USSR. The results of these investigations are published in a great number of local papers and books. However, despite the significant achievements of my countrymen in this field of science, the results of their work are largely unknown beyond the borders of the former USSR. Certainly this has occurred because of decades of my country's isolation from the West, but it is also due to language barriers."

I have said, many times, that moni-

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toring of total stress is one of the most difficult challenges that face those of us who attempt to make accurate field measurements. This comprehensive book should help us overcome the challenge.

- *"Rock Stress and Its Measurement"*, by Bernard Amadei and Ove Stephansson, 490 pp., ISBN 0-412-44700-2. Price \$229.95. The book is a monumental work, and possibly contains all you need to know about measurement of in situ stress in rock. It has a chapter on estimating in situ stress (without measurement), followed by chapters on the various measurement methods: hydraulic, relief, jacking, strain recovery and borehole breakout. Case studies and comparisons between the methods are included. The book also includes a chapter on monitoring of stress change.

Both books are written by authors who clearly are experts in their subject matter. Both are very comprehensive, with an enormous amount of information. However, I have a regret. When I try to increase my knowledge (and when I stop doing that, please tell me that I'm getting senile), I hope to find: "if this is your real-world practical measurement problem, let me hold you by the hand and guide you this way." Neither book guided me strongly enough.

The books can be ordered from Chapman and Hall by calling (800) 842-3636 or (606) 525-6600, fax (212) 260-1730. Recognizing the very high prices: "customer guarantee: if you are not completely satisfied with your purchase, simply return the item for a full refund." If any reader would like to write a more complete review of either book, for publishing in *Geotechnical News*, please contact me.

November 1997 Instrumentation Course in Florida

Thirty four people attended the course, and created an unusually international flavor: 3 from Canada, 2 from Croatia, 3 from Malaysia, 1 from Peru, 4 from Puerto Rico and 1 from Venezuela. To those of you who attended: thank you for coming. We plan on putting on a

similar course, also "on the beach" in Florida, in November 1999. If anyone wants to be on the mailing list, please let me know.

Crossing the Pond

Having been among the exciting North American geotechnical community for over 30 years, the homing instinct has taken charge, and my wife and I plan to relocate to England in spring/summer of 1998. No, not to retire, but to experience life with a somewhat different flavor/flavour, even though I expect to be crossing the Atlantic frequently. Was it Winston Churchill or George Bernard Shaw who said "two countries separated by a common language"? While in England recently we noticed many contrasts. Here are two:

- On a pub menu: "It is sometimes

advisable to let us know if you require a table to be reserved in the dining room or bar as we can get busy." Such verbosity! In USA: "Reservations are recommended".

- On the same menu: "Well behaved children are welcomed in the dining room or the rear section of the bar but we do ask that they remain quietly seated." Such social consciousness! In USA: "noisy kids".

Closure

Please send contributions to this column, or a separate article for GIN, to me. Please call me at (508) 655-1775 to find out current contact information: a recorded message will be on that line after I've left Massachusetts. Cheers! (England).

EEC to Standardize English

Having chosen English as the preferred language in the EEC, the European Parliament has commissioned a feasibility study to look at ways of improving efficiency in communications between Government departments. European officials have often pointed out that English spelling is unnecessarily difficult e.g. cough, plough, rough, through, thorough. What is clearly needed is a phased program of changes to iron out these anomalies. The program would, of course, be administered by a committee staffed at top level by participating nations.

In the first year, for example, the committee would suggest using "s" instead of the soft "c". Certainly, sivil servants in all sities would reseive this news with joy. Then the hard "c" could be replased by "k" sinse both letters are pronounsed alike. Not only would this klear up konfusion in the minds of klerikal workers, but typewriters kould be made with one less letter.

There would be growing enthusiasm when, in the sekond year, it kould be announsed that the troublesome "ph" would henseforth be written "f". This

would make words like fotograf twenty per sent shorter in print.

In the third year, publik akseptanse of the new spelling kan be expekted to reash the stage where more komplikatated shanges are possible. Governments would enkourage the removal of double letters which have always been a deterrent to akurate spelling.

We would al agre that the horrible mes of silent "e's" in the languag is disgrasful. Therfor we kould drop thes and kontinu to read and writ as though nothing had happened. By this time it would be four years sins the skem began and peopl would be reseptiv to steps sutsh as replasing the "th" by "z". Perhaps zen ze funktion of "w" kould be taken by "v", vitch is, after al, half a "w". Shortly after zis, ze unesesary "o" kould be droped from words kontaining "ou". Similar arguments vud of kors be aplid to ozer kombinations of leters.

Kontinuing zis proses yer after yer, ve vud eventuli hav a reli sensibl riten styl. After tventi yers zer vud be no mor trublis, difikultis and evrivun vud find it ezi tu understand ech ozer. Ze drems of ze Government vud finali hav kum tru.

Discussion: No More Judgment in Geotechnical Engineering: The Professional Legacy of ASTM?

Michael J. Byle

This is a discussion of an article by John Dunicliff et al that appeared in the December 1997 issue of *Geotechnical News* (pages 31-41).

Introduction

The discussion of practice standards in the subject article is a timely and important one. This issue goes right to the heart of what engineering practice is all about and deserves thoughtful consideration by parties on both sides of the debate. There is a clear desire on the part of consumers to have known agreed-upon standards for the acquisition of certain goods and services. This frees consumers from having to educate themselves on the nuances of what goes in to certain products and services, thus leveling the playing field for acquiring them as a known commodity rather than an unknown variable. The challenge is to determine what legitimately can and should be given commodity status. In instances where an individualized service or product is needed, the existence of a seemingly-applicable standard can work to the consumer's disadvantage.

On the other hand engineers are licensed experts who are paid to know the difference, and should not be required or expected to comply with inappropriate or inapplicable standards. Geotechnical engineers are especially aware of the need for judgment in evaluating the variabilities of nature. Professional judgment, based on experience and technical principles is the cornerstone of good engineering. How can you standardize that?

Comments on "Standard"

The issues are not as black and white as might have been indicated by the questionnaire included with the article. We should not consider "standard" to be a dirty word; that if used in reference to a piece of equipment or practice, would automatically doom us to becoming automatons incapable of judgment. But rather, we should consider how we can

best use standards to the advantage of the global community including engineers, contractors, owners and the public at large.

An important question is whether the subject matter of a "standard" is sufficiently defined to justify its publication as a standard. Some aspects of instrument installation may be well enough defined to justify standardization, how-

ever, the scope and tone of the standard, including its title, must be specific as to the cases for which the standard is applicable.

I do agree with Messrs. Dunicliff, Green and Mikkelsen that a great many applications of instrumentation are so site-specific as to defy standardization. The most glaring example is piezometers. While relatively simple devices, their installation and accuracy are inseparable from site-specific surface and subsurface conditions. A standard written for testing and accuracy of the instrument components and measurement devices would be useful, but one could not possibly hope to specify the as-installed accuracy or method of installation in a global standard. Such ambitions would be better handled in a textbook or installation guide.

Standards for Hardware

The geotechnical community as a whole could benefit from some standards related to instrumentation. Standardization of test methods for specifying manufactured instrumentation components would ease the burden on the geotechnical engineer in researching and comparing various "standard" components. Right now the engineer must rely on the manufacturer's published specifications, though the parameters reported in these specifications and the methods used by the manufacturers to establish these values are not necessarily standardized. Standards for how instrument component performance is reported and how instrument components should be tested would be quite helpful.

Geotechnical engineers often use one manufacturer's specification with an 'or equal' permitted. It is often not possible or desirable that the instru-

Putting forth a document as a standard that is not globally applicable (or nearly so) is a dangerous thing that will have all of the bad consequences that ASFE and the APJGP fear.

ments be "equal" to the specified manufacturer's version but only that they meet some specific criteria. The engineer is often in the dark when trying to determine what is, or is not, "equal", when instrument performance is not reported in a standard or comparable manner. Reliance on manufacturer specifications that are not comparable on an apples-to-apples basis leaves the engineer at the mercy of advertising rather than substance when selecting instruments.

The Global Issue

Standards have a place in geotechnical engineering, as has been demonstrated in the past with the laboratory testing standards. Engineering investigative, design and verification procedures cannot and should not be genericized into global standards. Global practice standards will, in the end, prove to be a waste of effort since more exceptions to the standards, than useful applications, exist. In this age where the demand is for turnkey, easy, no-brainer, idiot-proof engineering, we as a profession must resist the tide which is sure to inundate us with restrictive practice standards that weaken the profession, stifle creativity and ultimately work to the disservice to the people they are intended to benefit.

Often a seemingly standard solution will work for a great number of cases. When examined closely, these "standards" usually have only limited application. If we recognize this limitation and confine each standard to a specific set of conditions in a specific region with specific construction practices, with a defined level of contractor attention to detail, and other conditions affecting its usefulness and applicability; we will find that the standard is really only a

specification for an application and not a standard at all. The scientific method, while broadly applicable is not a standard, and neither should be basic engineering design practices.

There is a natural desire to create standards to bring order to the world. But we must resist the temptation to over-standardize. If we create a standard for the earth, the earth will not comply. Such an exercise would only succeed in deceiving ourselves, limiting the desire to expand our knowledge and reducing our ability to adapt to change. The earth is a widely varying place; and though large pieces of it may seem to be uniform, non-uniformity is more the norm. And, every seemingly uniform part of the earth is uniquely different from any other seemingly uniform part. At some sites, the only constant is the degree of variability. Nearly every geotechnical engineer can tell a story about the site from hell where nothing fit the standard approach. We are neither sufficiently

omniscient, nor divine, to adequately address such unknowns in a written standard.

Closure

The voting membership of ASTM must be circumspect in its evaluation of prospective standards. Standards are meant to provide uniformity where uniformity is helpful and desirable. ASTM is about testing and materials, not engineering design. We should endeavor to call "standard" only those things that truly are globally applicable and the standardization of which, would improve the common basis of *testing* and *materials*. We should not restrict or curtail creativity, direct engineering practice or invoke design procedures that effectively freeze the state-of-practice in any field. Putting forth a document as a standard that is not globally applicable (or nearly so) is a dangerous thing that will have all of the bad consequences that ASFE and the APJGP fear.

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REMINDER

Thesis List - 1998

To all PhD. students. . .

Geotechnical News will be publishing the PhD Thesis List for 1998.

Make sure you're included!

Submit your abstracts by April 1, 1998

See details on the inside back cover

Please photocopy, complete and forward the following questionnaire in response to the call for action (see page 26).

FAX TRANSMITTAL (Number of pages in this fax: _____)

Date: _____

To: John Dunicliff, (c/o BiTech) fax (604) 277-8125
 Allen Marr fax (508) 635-0266

From: Name: _____

Affiliation: _____

Fax No.: _____

Re: ASTM Subcommittee D 18.23's Preparation of Standards for Field Instrumentation

My views on preparation of standards for field instrumentation are on the attached page(s).

The following are my responses to the questionnaire (note that the scope of this questionnaire is limited to field instrumentation).

	YES	NO
1. Are you a member of ASTM Committee D-18?		
2. Are you a member of ASTM Subcommittee D18.23?		
3. Do you think that our profession would benefit from having guide documents?		
4. Is a document with "standard" in the title likely to stand in the way of engineering judgment?		
5. If a document has the word "standard" in its title, do you think that a juror will pay attention to a caveat which permits use of engineering judgment?		
6. Do you believe that publication of documents with "standard" in the title would encourage an inappropriate "cookbook" approach to specification writing, and discourage the thoughtful development of detailed custom designs prepared for the specific purposes and installation conditions of the project?		
7. Do you believe that, as suggested in Part 7, there are sufficient "aspects of instrumentation that are common to all installations" to merit standardization?		
8. Do you believe that we should work towards removing "standard" from titles, and use a term such as "practice guide"?		
9. If you answer "yes" to question 8, and if "we don't have the ability to alter ASTM's definition" (part 7), do you believe that another professional organization, e.g. ASCE's Geo-Institute should develop guides? (This is suggested in Part 2).		
10. Do you recommend that ASTM Subcommittee D18.23 limits its activities to "promote education, research, and exchange of information regarding field instrumentation for soil and rock?" (see item 1 in Part 1).		