
TESTING FORUM

The Soil Mechanics Information Analysis Center (SMIAC)- A Specialized Information Resource¹

The problems associated with keeping up with the literature in one's chosen profession are generally well recognized. In our own profession of geotechnical engineering, Arthur Casagrande, certainly one of our most knowledgeable and respected practitioners, stated in his 1965 presidential address before the Sixth International Conference on Soil Mechanics and Foundation Engineering that unless we find new ways of absorbing new information "our fate will be to drown intellectually in the literary effluent of our affluent society." Most will agree that this colorful description does not seriously overstate the dilemma and many recognize the need to devote resources to come to grips with the problem.

Department of Defense Support

Among those recognizing the need to do something has been the Department of Defense (DOD). In 1964 the DOD issued instructions for the establishment of centers for analysis of scientific and technical information. These instructions have resulted in the establishment of 18 information analysis centers. Twelve of these are operated or monitored by the Department of the Army. Of these, six are in the Corps of Engineers—one of which is the Soil Mechanics Information Analysis Center (SMIAC).

SMIAC is physically located at the U.S. Army Engineer Waterways Experiment Station (WES) in Vicksburg, Miss. The staff of the Geotechnical Laboratory at WES, which is recognized to be one of the largest and most competent in its field, supports SMIAC. The Center also works in close cooperation with the WES Technical Information Center, whose library collections are the data bases for SMIAC as well as other Information Analysis Centers at WES. The WES Library is reputed to have the most complete collections in its specialty fields; therefore, with the combination of staff and library, it was most logical that the Center be located at WES.

Scope of Activities

SMIAC was officially established in April of 1968, but it was not until 1971 that funding was provided. Its responsibility is to screen, filter, and reduce information in the fields of soil mechanics, engineering geology, rock mechanics, soil physics, and embankment and foundation engineering as thoroughly as possible with available funding. Authorized activities include

gathering information from worldwide sources, analyzing information using staff experts, evaluating and condensing information, and providing user services. User services include responding to requests for information, preparation of summaries of current technical trends, preparation of comprehensive state-of-the-art analyses, sponsorship of technical symposia, and the furnishing of specialized advisory services. SMIAC provides services not only to the entire DOD community but also to other federal agencies and their contractors. In addition, the Center has responded to reasonable requests for information from the general public to the extent that funding has permitted.

It has been estimated that a minimal staff of eight would be required to work in all areas of authorized activity. Funding has never reached the desired level, however. In fact, funding has hovered in the range of less than one to about three man-years of effort since it was initiated. Thus, it has been necessary to identify those tasks which are believed to have highest priority and to work on them at the expense of other desirable, but lower priority, tasks.

Responding to Requests for Information

The highest priority task has always been responding to direct requests for information. This task averages about a half man-year of effort each year. Inquiries range from requests for information on how to convert a marsh area into land suitable for cemetery use, to searches for 30- to 40-year-old basic data needed to correct design charts. Requests for information more commonly result in the preparation of a bibliography with the identification of what appears to be the most suitable article or publication for answering the question at hand.

Other services provided by SMIAC have included sponsorship of the 1972 technical symposium, "Application of Finite Elements in Geotechnical Engineering," and a microthesaurus of soil mechanics terms, prepared in conjunction with WES Library staff members. Current services include regular announcements and abstracts of recent library acquisitions, and evaluations and ratings of selected recent library acquisitions. In addition, the Center is working on a multilanguage glossary of soil mechanics terms and a computerized data base of geotechnical information.

Library Evaluations and Ratings

In the presidential address already mentioned, Professor Casagrande discussed the problem of identifying the few most pertinent references from the large number of items that might be cited in a bibliography. He accepts the advice of librarians who state that it is the task of knowledgeable and experienced men in each discipline to grade the professional literature in a

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meaningful manner. To accomplish this, Professor Casagrande proposed the following four-level rating system:

Rating A—Judged to be *immediately useful to a large number of readers*.

Rating B—Judged to be *immediately useful to a relatively small number of readers*, for example, highly specialized topics, regional soil studies, case histories, or papers containing important observational data.

Rating C—Judged to contain *little or no immediately useful material, but of potential future value*, and useful results may accrue from further investigations, for example, a paper containing an early development stage for a new theory, or a progress report on a construction or research project.

Rating D—Judged to be of *no value to the great majority of readers*. This would include papers on subjects that have been covered equally well or better in earlier publications, or papers containing highly speculative or doubtful material.

One of the possible benefits of such a rating system would be to de-emphasize the quantity of publications when comparing the qualifications of professional men. The threat of "publish or perish" is a fact of life at some academic institutions and is also present in most government and private research organizations. This pressure to publish would be substantially reduced by a rating system, and excellence rather than quantity of publication would be emphasized.

Professor Casagrande proposed that these ratings be assigned by reviewers who had judged a paper before it was accepted for publication. So far, no professional journals have instituted such a rating system. Since February 1976, however, SMIAC has included ratings and evaluation statements for selected publications announced in its listing, "Recent Acquisitions on Soil Mechanics and Related Subjects with Abstracts, Evaluation Statements and Ratings." These lists are released about once every two months and are distributed to some 300 offices, mostly in the military community. Each list, representing only a small fraction of all the items accessed by the library, contains abstracts for 8 to 16 recent acquisitions judged to be of most interest to the readership. In addition to the abstracts for each listing, evaluations and ratings appear for an average of three to four items.

Evaluations and ratings in the SMIAC listing are made by journeyman engineers of the WES Geotechnical Laboratory. Each evaluation is prepared by a single reviewer, but ratings are assigned by the evaluator and, normally, at least two others. It has been found that, on the average, it takes about 1½ man-days to make the evaluation and three ratings. It is, however, an unpopular task for the reviewers and a continuation of the effort will depend on a judgment of the value of the evaluations and ratings. It is still too soon to make such a judgment; to date, there has been no feedback from the readership on the evaluations and ratings, either pro or con. However, the list as a whole

is well received, and the announced titles inevitably lead to increased requests to the library.

Computerized Data Base

Another activity of SMIAC worthy of special mention is the ongoing development of a computerized data base of geotechnical bibliographic information. Although a number of commercial firms are computerizing bibliographic data from a wide variety of professional journals, none covers all the journals and other sources of interest to the geotechnical engineer. Therefore, SMIAC has initiated, on a trial basis, the development of a computerized data base which will include bibliographic data with abstracts from about 100 geotechnical-related journals to which the WES library subscribes, all WES Geotechnical Laboratory reports, geotechnical reports received by the WES library from other laboratories, and all articles in the proceedings of the International Society of Soil Mechanics and Foundation Engineering.

The computer is a relatively new tool that is rapidly expanding its use for efficient and rapid retrieval of bibliographic data; computerized data bases have mushroomed over the past few years. An essential part of this system, however, is the selection and identification of keywords that will be used for indexing and retrieval. Recognizing this need, SMIAC and the WES library prepared and published the microthesaurus of soil mechanics terms mentioned earlier. This thesaurus contains over 4000 keywords and is currently used for the data base. The computer is able to handle large numbers of keywords and the ability to search for information on the basis of combinations of two or more keywords will greatly increase the capability to rapidly identify the most likely source for the information desired.

Costs are a major factor in determining whether or not the computerized data base can be maintained and kept current. A survey of geotechnical literature indicates that about 2500 items of geotechnical information should be accessed each year. Cost for processing, key wording, transmitting, and editing each item prepared for computer storage is estimated to be about \$20. Thus, it appears that about \$50,000 will be required each year just for inputting new information. The data base is currently less than one year old, but it is hoped that after about three years of input, some of these operational costs might be recovered by sale of services from the data base.

Additional Information

Anyone interested in receiving the list of Recent Acquisitions on Soil Mechanics and Related Subjects with Abstracts, Evaluation Statements and Ratings, or other SMIAC services, may request such by writing to the Commander and Director, U.S. Army Engineer Waterways Experiment Station, ATTN: SMIAC, P.O. Box 631, Vicksburg, Miss. 39180.

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Committee D-18 News

Winter Meeting of D-18

The next winter meeting of Committee D-18 is tentatively scheduled for 28 Jan.-Feb. 1979 in Ft. Lauderdale, Fla. This will permit some jointly-scheduled sessions with Committee D-19 on Water and its subcommittees involved with hydrologic properties, solid waste management, and soil, rock, and water pollution. A symposium on subsurface injection, to be sponsored by Committee D-19, is scheduled for the same week.

Symposium on Permeability and Groundwater Contaminant Transport

A one-day Symposium on Permeability and Ground-water Contaminant Transport will be sponsored by Committee D-18 during the 17-23 June 1979 meeting in Philadelphia. Some of the topics to be covered are field and laboratory methodology for soil and rock permeability and capillarity; transport of ground-water contaminants; siting and monitoring of waste disposal sites; and comprehensive case histories concerning these topics. Publication in the form of an ASTM Special Technical Publication is anticipated.

D-18 Standards Adopted by Department of Defense

The U.S. Department of Defense has adopted eleven of Committee D-18's standards (D 420-69, D 424-59, D 558-57,

D 1140-54, D 1143-74, D 1586-67, D 1587-74, D 1883-73, D 2217-66, D 2922-71, and D 3017-72).

New Laws of Interest to D-18

Two new public laws, one dealing with solid waste management (PL 94-580) and the other with surface mining (PL 95-87), have generated an increased demand for D-18 standards on hydrologic investigation, sampling, drilling, and soil tests.

New Subcommittee D18.94 Formed

A new subcommittee, D18.94 on Education and Training, will deal with all levels of geotechnical engineering training, from self-study to formal certification. R. H. Karol will serve as chairman. Anyone interested in joining the new group should request an appointment from D-18 Chairman Ivan Johnson.

Liaison with Subcommittee G01.10

A liaison with ASTM Subcommittee G01.10 on Corrosion in Soils is being developed through Subcommittee D18.06 on Physico-Chemical Properties. The G-1 subcommittee is in the process of finalizing several new tests which concern D-18 interests: soil pH, soil corrosivity, and electrical resistance of soils.

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ASTM COMMITTEE D-18 ON SOIL AND ROCK FOR ENGINEERING PURPOSES

SCOPE

The promotion of knowledge, stimulation of research, and the development of specifications and methods for sampling and testing, nomenclature and definitions, and recommended practices relating to the properties and behavior of soil and rock for engineering purposes. Excluded are the uses of rock for building stone and for constituent materials in portland cement and bituminous paving and structures coming under the jurisdiction of other committees.

It will be the policy of this committee to avoid, insofar as it is possible, dealing with methods of design of engineering structures and all those features of general practice in the use of soil and rock as engineering materials which may not comprise methods of sampling and testing. It will, however, be considered within the scope of the committee's work to promote by every desirable means the close cooperation of other organizations and committees whose field of endeavor is closely allied to that of soil and rock testing.

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TECHNICAL

D18.01 Surface and Subsurface Reconnaissance

R. E. Gray

D18.02 Sampling and Related Field Testing for Soil Investigations

H. E. Davis

D18.03 Texture, Plasticity, and Density Characteristics of Soils

R. S. Ladd

D18.04 Hydrologic Properties of Soil and Rock

C. O. Riggs

D18.05 Structural Properties of Soils

J. P. Singh

D18.06 Physico-Chemical Properties of Soils and Rocks

N. O. Schmidt

D18.07 Identification and Classification of Soils

D. A. Tiedemann

D18.08 Special and Construction Control Tests

J. R. Talbot

D18.09 Dynamic Properties of Soils

M. L. Silver

D18.10 Bearing Tests of Soils in Place

S. Williams

D18.11 Deep Foundations

F. M. Fuller

D18.12 Rock Mechanics

E. R. Podnieks

D18.13 Marine Geotechnics

A. F. Richards

D18.14 Soil and Rock Pollution

T. F. Zimmie

ADMINISTRATIVE

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R. C. Deen

D18.92 Papers

E. T. Selig

D18.93 Nomenclature for Soil and Rock Mechanics

A. I. Johnson

D18.94 Education and Training

R. H. Karol

D18.95 Information Retrieval and Data Automation

A. Pelzner

D18.96 Research Steering

J. W. Guinee

D18.97 Special Awards

C. B. Crawford

D18.98 Hogentogler Award

E. T. Selig

D18.99 Evaluation of Data

W. A. Goodwin