



GRL NEWSLETTER

No. 15

INFORMATION GATHERED BY THE ENGINEERS OF
GOBLE RAUSCHE LIKINS AND ASSOCIATES, INC.

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1990 PDA USERS DAY SERIES COMPLETED

A record-breaking number of PDA Users Days were held in 1990 and more engineers than ever before participated. Earlier (GRL Newsletter 14) we had reported on the European and American events. The Far East PDA Users Day program started on October 18 and 19 when approximately 30 users from Australia, The People's Republic of China, Hong Kong, Indonesia, Japan, Malaysia, Singapore, and Taiwan gathered in Hong Kong. Several user presentations were made. A strong emphasis was placed on drilled shaft testing (see page 2).

A few days later, on October 21, 22, and 23 more than 100 PDA users and engineers actively participated in the proceedings at the "Expert House" of renowned Tongji University in Shanghai. The event had been organized jointly by the geotechnical department of Tongji University and Earth Technologies of Hong Kong, our representatives. The program included a demonstration of the GCPC Pile Driving Analyzer and the P.I.T.-SC low strain integrity tester at the site of the first high level Huang-Po River Bridge. Of course, it rained when the 29 m long 400x500 mm (95 ft, 16x20 inch) precast pile, spliced at mid-length, was driven with a diesel hammer. However, the measurements proceeded flawlessly since preparations had been expertly made by the engineers of the East China Electric Power Design Institute. A set of interesting CAPWAPC and P.I.T. results from this field test were presented to and analyzed by the seminar attendees the morning after the test. Both high strain and low strain records clearly indicated reflections from the splice, minor cracks and the pile toe.

Finally, a group of about 50 engineers met at the Institute of Engineers in Guangzhou on October 25. This city is undergoing an immense construction boom and the PDA of the Guangdong Provincial Research and Design Institute appears to be in continuous use.

At the conclusion of the Shanghai 1990 PDA Users Day, from left Prof. G.G. Goble, Prof. Tang Nian-Ci (Nanjing), Prof. Zai Jin-Zhang (Shanghai), Mr. Shen Ren-Gong (Nanjing) and Dr. Frank Rausche.



SEASON'S GREETINGS

We wish all our readers a very joyous and, most importantly, peaceful holiday season. Many thanks to our clients and friends for their continued support and trust. May the New Year bring you happiness, fulfillment and prosperity.

MOHAMAD HUSSEIN ELECTED GRL PARTNER

Goble Rausche Likins and Associates, Inc. is pleased to announce that in September, 1990, Mohamad Hussein, manager of the GRL Orlando office was elected a partner of GRL and also of Pile Dynamics, Inc. (PDI).

Mr. Hussein is a graduate of Cleveland State University and a registered engineer in the State of Florida. He joined GRL in 1982 as a staff engineer and advanced to senior engineer and office manager in 1987.



During his eight years with our firm, Mohamad has conducted dynamic pile tests and analyses in 34 USA states and 8 countries. His experience also includes numerous unique offshore projects and innovative applications of dynamic testing to difficult problem sites.

Mohamad has a very clear understanding of the dynamics of pile driving and successfully uses the Pile Driving Analyzer, the P.I.T. equipment and the related software for hammer performance evaluations, pile stresses and integrity determinations, quality assurance and bearing capacity predictions of piles and drilled shafts. He has applied these capabilities to numerous demonstration projects. Being a talented speaker and prolific author, Mohamad has made many presentations at professional conferences and universities. He is an active member of the geotechnical group of the Florida East Central Branch of ASCE and a member of several other professional organizations.

DYNAMIC CAPACITY TESTING OF DRILLED SHAFTS

During the Users Days and seminar series conducted in the Far East, bearing capacity testing of drilled shafts was a subject of general interest and discussion. Professor Tang Nian-Ci of South-East University in Nanjing described several Chinese projects where special rams and lifting mechanisms had been built for dynamic capacity testing to 20 MN (2000 tons). This is now apparently a routine test performed by several Chinese organizations having PDAs. Similarly, in Singapore and Malaysia, the subject of drilled shaft dynamic testing was as frequently discussed as precast or offshore piling.

GRL's F. Rausche was invited by P. Somehsa, manager of pile testing of Fugro-McClelland Singapore, to report on USA drilled shaft testing and to visit a site in Singapore where 80 dynamic tests of drilled shafts with diameters between 900 and 1600 mm (3 to 5 ft) were conducted. The shafts were socketed several meters into very dense sand and therefore exhibited high shaft resistance. Static tests up to 30 MN (3000 tons) usually did not reach failure. Dynamic tests did reach permanent sets near 2 mm and predicted loads on some shafts up to 40 MN. The success of the tests is in part attributed to the 25 Mg (27.5 tons) ram with up to 4 m (13 ft) free drop height. Lower ram weights would have precluded successful testing in the 30 MN range.

GRL can provide testing services using a 10 ton ram (sufficient for drilled shaft tests up to 1200 tons) which is available from Pileco, Houston. This device will again be utilized for a research and demonstration project conducted at Texas A&M University under the direction of Jean-Louis Briaud.

SPT SEMINAR

The SPT seminar, announced in our previous GRL Newsletter issue, attracted 25 engineers. They learned about research conducted at the University of Colorado by Prof. George G. Goble in measurement accuracy, energy determination and calculating soil properties from this test.

CONGRATULATIONS ...

to Maunsell Proprietary Limited who received an Engineering Award from the Association of Consulting Engineers Australia for pile monitoring using PDI underwater transducers.

GRLWEAP NEWS

We have sent a GRLWEAP program update to all users with a current maintenance contract. The new release addresses the occasional numerical problems described in GRL Newsletter 14. To correct this problem, the program now has an increased IPHI default value (value of 200).

TWO SEMINARS PLANNED

Prof. G.G. Goble plans to hold two 2-day seminars. On February 28, with Jay Berger in Boulder, CO; the subject will be dynamic testing on piles with wave equation theory. March 1 will be a GRLWEAP workshop.

On March 22 in St. Louis, MO with Dr. D. Michael Holloway, Insitutech, design and construction control of piles will be discussed. March 23 will again be a GRLWEAP workshop.

Please see calendar of events for time and location and contact GRL Cleveland for further details.

The wave equation seminar conducted on Nov. 8 in Columbia, S.C. attracted almost 60 engineers from government agencies, consulting and contracting firms. The day-long event was sponsored by Pile Equipment, Pileco, Geoquip, and Vulcan Iron Works. Thanks to all of them and to Mark Rutland and Dick Nelson for flawless organization.

BRAZIL

Jorge Beim of PDI Engenharia, Rio de Janeiro reports that seven Franki piles with diameters of up to 600 mm (2 ft) and lengths to 15 m (50 ft) were tested to capacities of up to 4 MN (440 tons). The piles had enlarged bases of up to 1000 mm (3.3 ft) diameter and the Franki standard drop weights of 3 and 4 Mg (3.3 and 4.4 tons) were used as impact devices.

SEATTLE

GRL Seattle manager Bert Miner concluded PDA work for test piles and monthly construction control tests for the Carrier Complex in the Everett Homeport. General-Manson, A Joint Venture, drove 1700 piles including hollow 24-inch (600 mm) octagonal prestressed concrete sections with length exceeding 180 ft (55 m). ABAM Engineers (designer) and Hart-Crowser (geotechnical engineers) directed a program which included 24 PDA and 8 static load test piles.

1990 DFI MEETING DEMONSTRATION

Several test pile demonstrations were conducted at the 1990 Annual Meeting of the Deep Foundations Institute in Seattle, WA. Bert Miner demonstrated the P.I.T.-SC equipment in front of a crowd of conference attendees on three augercast piles. He correctly identified pile length and one intentional soil defect. A second planned but unconfirmed flaw was not evident in the P.I.T. records.

A paper jointly authored by GRL Colorado manager Jay Berger and David Cotton of Golder Associates entitled "Low Strain Integrity Testing of Deep Foundations" was presented by Bert at the same meeting.

NEWS FROM PILE DYNAMICS

For fast and accurate vertical or inclined alignment of a pile, the PDI Angle Analyzer (AA) is invaluable. This unit has been tested over several years and has recently been delivered to Pileco, Houston, S.K. Whitty, New Orleans and Wagstaff Pile Driving, Australia. The AA consists of a sensor unit for installation in the leader and a readout unit which gives x, y and compound angles.

1991 EVENTS CALENDAR

- Jan. 13-17 TRB Meeting, Washington, D.C., Specialty Session on Pile Integrity Testing
- Jan. 21-23 Symposium on the Dynamic Testing of Piles, Institut fuer Grundbau, Univ. of Braunschweig, W-Germany
- Feb. 6-10 ADSC Annual Meeting, San Antonio, TX
- Feb. 28-3/1 Dynamic testing seminar and GRLWEAP workshop in Boulder, CO
- Mar. 19-21 Internat'l Conf. on Deep Foundations, Paris, France
- Mar. 25, 26 Seminar on Design and Construction Control of Piles and GRLWEAP workshop in St. Louis, MO
- Apr. 7-12 DFI 4th Internat'l Conf. on Piling and Deep Foundations, Stresa, Italy

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