



GRL NEWSLETTER

No. 23

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

JUNE 1994

ORLANDO: CITY OF PILE CONFERENCES

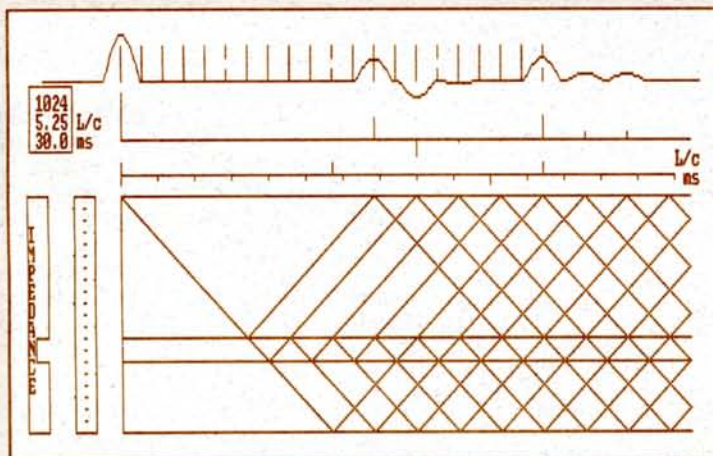
The first big Orlando piling conference in 1994 was the **1994 PDA Users Days**, held on February 18 and 19 at the Renaissance Hotel. More than 60 engineers participated, primarily from the Americas. As usual, the focus of this event was directed at the day-to-day knowledge needs of the pile testing professionals. However, lively discussions and presentations on new developments added the needed spice. Guest speaker Dr. Bengt Fellenius, Anna Geodynamics Inc. (AGI), Canada spoke on "The Critical Depth. How it came into being and why it does not exist"; Dr. D. Michael Holloway, InSituTech, California; Mark Mongeau, Ardaman & Associates and Dr. S.M. Sayed of Geotech Consultants International Inc., of Florida lectured on geotechnical and engineering professional subjects entitled "Difficulties encountered with long H-piles installations", "Marketing Engineering Services" and "How the geotechnical engineer uses PDA results", respectively.

New developments presented at the meeting included GRL software improvements in CAPWAP® and GRLWEAP™ (see box), and general data acquisition software for the PDA user.

Among hardware improvements are the 8-channel Pile Driving Analyzer® (PDA Model PAK) by Pile Dynamics, Inc. (PDI) which now allows for much more accurate measurements on large diameter piles. Particularly for drilled shaft dynamic testing, this new feature has become indispensable.

NEWS FROM PILE DYNAMICS, INC.

PDI also offers a P.I.T. demonstration program which has been written by Mr. Shen Ren-Gong, Nanjing, China. The program displays the path of impact and reflection waves (see figure) and therefore helps in the interpretation effort of sonic pulse echo records.



PIT demonstration analysis showing pile top reflections and stress wave paths.

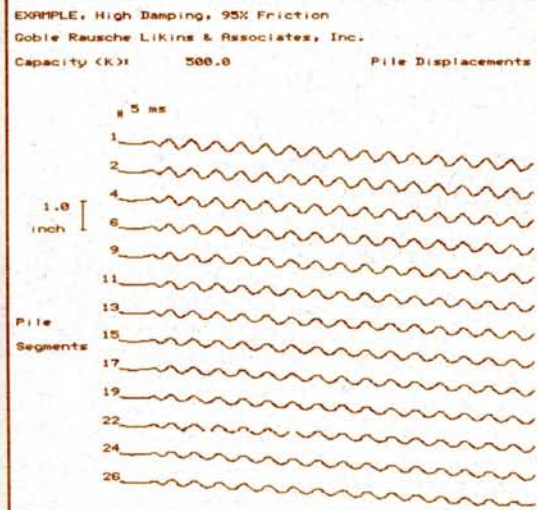
GRL PERSONNEL NEWS

GRL welcomes *Bradley Gipson* as a software engineer to GRL's Cleveland office. Brad has graduated from Buchtel College of Arts and Sciences at Akron University. He works under the direction of *Dr. Frank Rausche* on GRLWEAP and client support.

GRLWEAP NEWS

Contrary to the initial experiences reported by a few users, GRLWEAP actually **does** run under WINDOWS™ as a non-Windows application. User Scott Simons, International Construction Equipment (ICE), North Carolina actually made himself a little icon. He feels, however, that GRLWEAP runs faster under DOS.

A vibratory hammer analysis option was revealed to the Orlando Users Days crowd. This option realistically analyzes vibratory hammer pile driving given an equally realistic estimate of the soil resistance **at the time of driving**. The figure below shows a screen display of pile displacements. Our readers are also reminded that measurements of pile top force and acceleration under vibratory hammers yield important information on hammer performance, energy or power transfer and pile stresses. Unfortunately, a realistic model for the prediction of bearing capacity from driving progress (for example in ft/min) and the calculation of ft/min from soil information are still an elusive goal.



GRLWEAP calculated pile displacements under a vibratory hammer as a function of time, showing pile penetrating over 1 second.

1994 PDA USERS DAYS SLATED FOR EUROPE

September 8 and 9, 1994 have been selected as the dates for the 1994 PDA Users Days in Europe. The event will be held in Göteborg, Sweden, a city with a rich tradition in pile driving, pile technology development, and PDA Users Days. The Users Days program will emulate the successful Orlando Users Days. Our PDA users are cordially invited along with all of those engineers who regularly specify or use PDA technology in their professional practice. Also refer to the Calendar of Events.

CALENDAR OF EVENTS WITH GRL PARTICIPATION 1994

U.S.A.

- Jun 16-18 College Station, TX, **ASCE Settlement 94, Vertical and Horizontal Deformations of Foundations and Embankments**, contact Dr. Albert Yueung (Ph: 409-845-2538).
- Sept 29-30 Philadelphia, PA, **Seminar and Workshop on Wave Equation Analysis of Piles using GRLWEAP**, organized by Wondem Teferra, GRL Philadelphia and Dr. Frank Rausche, GRL Cleveland (Ph: 216-831-6131, Fax: 216-831-0916).
- Dec 6-8 Orlando, FL, **FHWA International Conference on Design and Construction of Deep Foundations**, All American Soils, Inc. (Ph: 714-547-7178, Fax: 714-668-1050).

INTERNATIONAL

- May 27 British Columbia, Canada, **Vancouver Geotechnical Society 8th Annual One-Day Symposium on Deep Foundations**, contact Dr. Alex Sy, Klohn-Crippen Consultants Ltd. (Ph: 604-273-0311, Fax: 604-279-4300)
- May 28 British Columbia, Canada, **Seminar and Workshop on Wave Equation Analysis of Piles using GRLWEAP**, organized by Bert Miner, GRL Seattle and Dr. Frank Rausche, GRL Cleveland (Ph: 216-831-6131, Fax: 216-831-0916).
- Jun 13-15 Burges, Belgium, **Fifth International Conference and Exhibition on Piling and Deep Foundation**, organized by DFI (Fax: 201-729-0732).
- Sep 8-9 Göteborg, Sweden, **PDA Users Days**, organized by Carl-John Grävare, Pile Dynamics Europe Ltd. (Ph: 46-31-454307, Fax: 46-31-459980).
- Nov 6-11 Foz Do Iguacu, **Brazilian Conference on Soil Mechanics**, contact Sussumu Niyama of IPT (Fax: 55-11-869-3241).

GRL ENGINEERS ON OFFSHORE ASSIGNMENTS

Bert Miner (GRL Seattle) has just returned from an offshore platform construction site in the South China Sea. Jay Berger (GRL Colorado) and Mark Johnson (GRL Florida) have returned from Angolan waters where they were working with engineers of Sage Engineering Ltd, UK and Switzerland on leg and skirt pile installation measurements. Steve Abe (GRL Cleveland) and Al Stegkamper (GRL Florida) now have taken over the second shift at this project.

INSTRUMENTED SOIL EXPLORATIONS

GRL engineers have been involved in several projects involving either SPT or Becker Drill In-Situ test devices. Gabriel Thendean (GRL Cleveland) is in Perry and Vilano Beach, FL for both static and dynamic SPT testing. At Lake Success, CA and at Bradbury Dam, CA, Dr. George Goble (GRL Colorado), Dr. Hasan Abou-matar and C. Michael Morgano (GRL Cleveland) have taken standard PDA measurement on a Becker drill for energy transfer and shaft resistance assessment. Also Pile Dynamics, Inc. built and GRL now uses a bounce chamber pressure measurement device for the Beckers' ICE 180 closed ended hammer.

We would like to remind our readers of the upcoming December 1994 Conference on Design and Construction of Deep Foundations sponsored by the Federal Highway Administration.

PDA TRAINING ACTIVITIES

Dr. Wasim Iskandarani of I & M Mohamad Mukkaddam Est., U.A.E. in Dubai and Sherif Nassar of Pile Testing of Egypt have visited GRL's Cleveland office. Dr. Woojin Lee, Sang Heon Lee and Young Jae Choi all from Korea and Samsung Engineering & Construction Co., Ltd., along with In-Mo Lee, Yong Jin Kim and Yoo Joung Choi of Korea University of Korea and Riekie Kariyanto, Budiharto Lawidjaja and Manuel Suryahimsa of P.T. Indonesia Pondasi Raya, Indonesia have visited our Orlando office in January.

New Mexico State Highway Department, Foundation Engineer, Mike Levine had to test H-piles under a bridge of I-40 which runs parallel to the historic Route 60 in Gallup, NM. Dr. Frank Rausche helped with these measurements and the associated analyses as part of a CAPWAP/PDA training. Existing concrete filled pipe piles were successfully checked for pile length using a P.I.T. Collector.

Scott Webster (GRL Chicago) has just returned from Seoul, Korea where he instructed engineers from Hyundai Engineering & Construction Co., Ltd. in the use of our software and hardware. At the time of this newsletter printing, Messrs. Young Suk Jun, Won Je Lee and Hun Sung Hong of Deep Foundations Institute, Korea have come to Orlando, FL for training.

Note: We have changed the fax number at our GRL Orlando office, the new number is 407-826-4747.

GRL SEMINAR SCHEDULE

One week after our Orlando 1994 PDA Users Days, a GRLWEAP seminar was held in Boulder, Colorado by Dr. George Goble, Jay Berger (both GRL Colorado) and Pat Hannigan (GRL Chicago). Another GRLWEAP workshop is now scheduled for May 28, 1994 in Vancouver, B.C., Canada in conjunction with the Vancouver Geotechnical Society's 8th Annual Symposium on Deep Foundations. Also, a GRLWEAP seminar and workshop will be held this September in the Philadelphia area. For information, please call 216-831-6131.

VIRGINIA

Project Construction Manager, M.E. Stone of SEI in Sealston, VA sent a letter of commendation which states: "I would like to commend GRL and Mr. Webster, in particular, for the professionalism and effort displayed through the test program; we certainly appreciate the results." The letter was written after Scott Webster, (GRL Chicago) performed static and dynamic tests at the Birchwood Power Facility, King George, VA.

PROFESSOR HARRY NARA 1921-1994

Proposer of the 30 year old Case Method Prof. Saada, chairman of the Civil Engineering Dept. of Case Institute of Technology informed GRL that on March 18, 1994, Prof. Harry Nara, a member of the faculty of Case Western Reserve University for forty years, passed away at the age of seventy-two.

Dr. Nara earned all of his college degrees at Case including a doctorate in Engineering Mechanics in 1951. He stayed at Case where he advanced from instructor to professor and held a number of high administrative positions.

Dr. Nara was a superb teacher and an excellent researcher. In the 1950's, his research established relationships between projectile penetration and soil embankment properties, a subject that strategists have to worry about during military campaigns. However, those results gave birth to a whole new technology of predicting pile capacity during driving. This technology was developed at Case by Goble, Rausche and Likins, and is now called the Case Method.

Dr. Nara will be remembered by legions of former students and colleagues.

GRL

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