



Prospectus of International Press-in Association

The Press-in Method is a construction method in which piles are pressed into the ground by a static load, utilizing extraction resistance as reaction force. By this method piles can be installed exactly as designed and their behaviour monitored as they are pressed into the soil with minimum environmental impact. The Press-in Method has been developed on construction sites by Giken Seisakusho Co., Ltd. of Japan, and the press-in principle which has guided this development has first been proved in practice before becoming established as a field for academic study.

From the start, the Press-in Method stood separately from other construction methods in its fundamental superiority in contrast to conventional methods of pile installation such as percussion, vibration and boring, which have inherent negative features. With the superiority of the press-in principle, it is possible to install the optimal piles that no other method can install, and to eliminate environmental hazards such as noise and vibration from piling work at construction sites. It has opened a new field in the construction industry where a retaining wall of piles constructed by the Press-in Method can be used as the wall of the structure itself, rather than just as a temporary wall.

Moreover, the press-in principle has brought to fruition a method known as the GRB System in which all the elements of piling-related equipment, such as the press-in machine "Silent Piler", pile pitching "Clamp Crane" and pile transporting "Pile Runner" etc., carry out the work systematically from the top of fully installed piles as they pass along the row, always supporting themselves. Temporary works, which are symbolic of a waste of valuable resources, can thereby be eliminated. The press-in principle and the Press-in Method have been developed by continuously adding a great number of new inventions and ideas. Today they are established as a technological contribution to "the environmentally friendly 21st century".

As for the academic pursuit of knowledge on piles, about 7000 papers on the various theories of soil pressure and bearing capacity have been written in the fields of soil mechanics and geotechnical engineering. Most of them, however, are based on the traditional method where the bearing capacity of the pile is estimated from the percussive energy in a hammer blow, or from unproven theoretical assumptions. They are not based on the measurement of the physical process of the behaviour of soil particles and the stress on piles during installation. As a result, research efforts have been concentrated on the performance and the bearing capacity of completed piles and foundations without the benefit of information derived from the installation and without the benefit of close control of the process. Thus, large safety factors have to be incorporated in the design. The piled foundations of large construction works, which cost tens of millions of dollars, are still mainly designed using coefficients derived from statistical correlations based on general industry practice and poorly controlled technologies, rather than on a detailed understanding of the underlying behaviour of piles.

In contrast, the Press-in Method utilizing a static load can control the movement of a pile as it penetrates into the soil, and is partially extracted between jacking strokes, enabling the empirical separation of pile toe resistance and skin friction. This opens up new possibilities for understanding pile behaviour, and observing the contrast between

conventionally installed piles, and those constructed by the Press-in Method. Recently Mr Akio Kitamura, President of Giken Seisakusho Co., Ltd., wrote a paper entitled "The Press-in Essentials", based on his over 40 years of experience and on data accumulated by the company. This is an achievement arising from engineering practice on construction sites using pile installation by the Press-in Method. We now aim to make comparable academic advances to further clarify the relationship between pile installation characteristics, structural performance, and soil types.

Research on the Press-in Method is now expanding and experimental data is being accumulated in research institutes and universities. Yet this data is still on a small scale and should be tested against the data from actual construction sites, facilitated by academic-industry collaborations. This new association aims to accelerate cooperation between such academic investigators and companies who can offer field proof on real sites.

As a first attempt to achieve this, the Department of Engineering, University of Cambridge, and Giken Seisakusho Co., Ltd. started a collaborative research project in 1994 for the academic elucidation of the press-in principle. This project aimed to clarify the mechanisms of pile penetration so as to generate an academic understanding of the experiences and data accumulated at construction sites. It also aimed to develop a multi-disciplinary study of press-in technologies in the context of soil mechanics, geotechnical engineering, piling machines, environmental problems, construction management etc.

The Geotechnical and Environmental Group in the Department of Engineering, University of Cambridge, headed by Professor Malcolm Bolton, has continued its participation in this collaborative research over the last 13 years. Kochi National College of Technology also began to take part in 2006. The University of Cambridge awarded a doctorate degree in Press-in Engineering in 2002. A manager of Giken Seisakusho Co., Ltd. was also awarded a doctorate degree in the same in 2004. Two other collaborative research projects between Giken Seisakusho Co., Ltd. and research laboratories of Tokyo University are also in progress. Research on Press-in Engineering is spreading steadily.

In order to further these aims, an IPA Preparatory Committee has been established comprising Mr Akio Kitamura (President of Giken Seisakusho Co., Ltd.), Professor Malcolm Bolton (Cambridge University) and Professor Hajime Okamura (President of Kochi University of Technology). The IPA Preparatory Assembly was launched at Kochi University of Technology, Japan on 9th September 2005, at a gathering of over 30 academic experts in Civil and Geotechnical Engineering. Additionally, the IPA Preparatory Committee held a reception on the occasion of 16th ICSMGE in Osaka, Japan, on 14th September 2005 and welcomed many international experts. The IPA Preparatory Committee is very grateful for the strong support and valuable advice received on those occasions.

With the start of the 21st century, it is necessary to tackle unsolved problems from a novel and inventive point of view, and by solving these set new standards for the future. We herewith propose to establish the "International Press-in Association" to overcome environmental problems in the construction industry, to establish a well-proven theory in the field of foundations which are literally the base of all construction, and to carry out all construction work whilst satisfying the public interest. The association aims to carry out academic research on the press-in principle and to promote the principle.

We are therefore sending this letter to potentially interested colleagues, inviting you to participate in the International Press-in Association. If you agree to do so, please contact the secretary of the IPA. We will then notify you in due course of schemes developed by the IPA Preparatory Committee including the articles of association, future meetings, workshops, reports on researches conducted by the IPA, and a website that we will set up.

The first official assembly of the IPA is to be held on 15th and 16th February 2007 in the Cambridge University in U.K. with the aim of stimulating and coordinating research. The IPA will support research activities related to the press-in principle by awarding research grants (up to USD20,000 per grant, nominally of 12 month duration, up to 5 grants). Please refer to the attached "Call for Proposals". Your active participation in the assembly, either as a project proposer or as an expert advisor, is requested.

We welcome individuals, students and corporations worldwide who are interested in this prospectus to participate in the Association.

The IPA Preparatory Committee

Akio Kitamura	President,	Giken Seisakusho Co., Ltd.
Malcolm Bolton	Professor,	The Department of Engineering, University of Cambridge
Hajime Okamura	President,	Kochi University of Technology

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