International Press-in Association
www.press-in.org

News Letter

Volume 2, Issue 3 September 2017

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Editorial Board

Message from New Vice President

Prof. C F Leung
Department of Civil and Environmental Engineering
National University of Singapore

I am pleased to write a message for the present issue of IPA Newsletter. My involvement with IPA dates back to July 2011 in Kochi, Japan, where I attended the Press-in Seminar. I then coordinated the 4th IPA Workshop held in Singapore in December 2012. The Workshop speakers included lectures from both Singapore and overseas and was well attended by practing engineers from the government authorities, statutory boards, consultants and contractors from Singapore. With the launch of the English version of the 'Press-in Retaining Structures: A Guidebook' in late 2016, Singapore was also the first place that the Handbook was officially launched overseas in March 2017. This took place during the IPA Seminar held in Singapore with two speakers from Singapore and another two from Japan sharing their press-in piling experience and know how. I also delivered a lecture on 'Press-in Singapore Experience' to over 200 participants during the Press-in Seminar held in Kochi this July.

Singapore has been using press-in technique for a long time with standard press-in machines employed in various projects at least about 15 years ago. With more powerful press-in machines available, Singapore engineers had employed the powerful machines to install sheet piles and steel pipe piles in hard ground and weak rock conditions with success. The use of press-in technology has also gained ground in Southeast Asia countries such as Malaysia, Vietnam and Thailand recently. One of my aims is to promote the know how of press-in technology worldwide, particularly in Southeast countries. Seminars and workshops can be held to share the advancement of the technology and highlighting projects that press-in technology is superior to other existing methods. Cost is a often a great concern in construction projects, I hope to relate the message to all stake holders including government authories, consultants and contracts that one should look construction as a whole including safety, viability, noise and vibration, time and cost to arrive at the most optimum solution for construction. In view of the above, currently I am working with engineers in Singapore to evaluate the noise and vibraton aspects of press-in piling versus traditional piling method such as the use of vibro. I hope to share with you on the findings in the near future.

◆ A brief CV of Prof C F Leung

Dr. C F Leung is a professor in the Centre for Soft Ground Engineering, Department of Civil and Environmental Engineering, National University of Singapore. His research interests include offshore, marine and onshore geotechnical engineering and centrifuge modelling of geotechnical problems. He has written many international journal papers and given over 20 keynote/invited lectures at international geotechnical and offshore engineering conferences worldwide. Prof Leung has served as the geotechnical consultant for over 100 projects in Singapore and overseas.

Message from New Vice President

Prof. Yoshiaki Kikuchi

Department of Civil Engineering
Tokyo University of Science, Chiba, Japan

I assumed one of the Vice Presidents of IPA this time for the term 2017-2018. I had belonged to Port and Airport Research Institute, Japan, for many years, and was engaged in research on ground and foundations in coastal areas. Especially, the research on pile foundation has been my main research field. In Japanese port construction projects, we mainly use steel pipe piles as piles, and we are constructing steel pipe piles by driving method. Conventionally, problems of lateral resistance of piles have been dominant over piles used for harbor facilities, but in recent years, the number of cases where the bearing capacity of a large-diameter long-length pile becomes an issue, is increasing due to the fact that the port facility has become larger and the structural types change. For this reason, I am studying the bearing capacity problem of piles.

I have been involved in International Press-in Association for around seven years since I have been studying geotechnical problems of harbor strucuters. This academic society has international activities in mind since its establishment, I think that this is unique and we should extend this uniqueness. I have participated in various IPA academic activities such as compiling design and construction guidelines for Press-In Method writen in Japanese and engaging in English translation of the guidlines. In addition, I am participating in three research committees that have started their activities after Prof. Kusakabe became the IPA President. The more knowing this Press-In Method, the more interesting it becomes. I hope to support this technology from the view of academic and scientific approach for further developing of this technology.

I would like to fulfill my duty as Vice President by contributing in promoting future academic activity policies that current IPA President has been aiming for since his taking office.

◆ A brief CV of Prof. Yoshiaki Kikuchi

【Office】 Professor, Department of Civil Engineering, Faculty of Science and Technology, Tokyo University of Science Educational and Professional Experience

【Education Background and Professional Experience】

1981	Graduated Faculty of Engineering, University of Tokyo.
1983	Graduated Master Course of Civil Engineering, Graduate School of University of Tokyo.
1983 – 2012	Port & Airport Research Institute(PARI)
2012-present	Professor, Department of Civil Engineering, Faculty of Science and Technology, Tokyo University of Science
2017-present	Vice President of Japanese Geotechnical Society

Message from the outgoing Secretary General

Dr. Tadahiko Okumura
Engineering Advancement Association of Japan
Director of Geo-space Engineering Center

I have had the pleasure of serving as the IPA Founding Secretary General from the inauguration until the present. It has been a fruitful 10 years. I clearly remember the Inaugural ceremony held at Cambridge University in February of 2007. We explored many ideas prior to this important event and prepared many things, including the program, the documents to be handed out and the list of candidates for the position of Board members. That was my first experience to establish the academic association. After establishing IPA, we started to have a series of International workshops in various places; the second workshop in New Orleans in 2008, the third in Shanghai in 2010, the fourth in Singapore in 2012 and the fifth in Ho Chi Minh in 2014. Those are great memories to me. I believe that these workshops have been effective in disseminating the Press-in technologies throughout the world. We also introduced the IPA Research Grant Award program, which have been effective in triggering innovative ideas and initiating new research activities.

Since I had limited knowledge and experiences in managing an academic association, many people including the IPA President, the Directors, the Auditors, the Honorary President, the secretariat staff and Giken staff, have supported me in fulfilling my duties. I could not have done anything without these supports. I really appreciate and thank everyone for their kind and long-term support.

I believe the Press-in technology is superior to other piling technologies. I have faith that it will further develop and will be used widely throughout the world. Finally, I would like to extend my sincere gratitude to all IPA members. Thank you!

Message from the incoming Secretary General

Mr. Kazuyoshi Ishii

Ten years have been passed since IPA was inaugurated in 2007 and I have involved in IPA activities for past four years as the Auditor since 2013. I believe that IPA is now making a transition from the founding stage to the progressive stage with the following activities plan with a functional operation.

Planned activities

A) Conducting consecutive researches through Technical Committees' activities led by the Directors
B) Publication of Newsletters (quarterly issue) as a tool to transmit information on the Press-in technology globally
C) Planning and taking place of the **International Conference on Press-in Engineering 2018** (ICPE 2018)
D) Publication of the Press-in manual/handbook to facilitate global dissemination with holding Seminars
E) Periodic up-date of a handbook and multilingualization
F) Renewal of IPA web-site as a strong tool for dissemination of IPA activities as well as the Press-in technology

Systematic and functional operation

A) The resident President on duty to execute planned activities
B) Amended Constitution and institution of By-laws/Regulations to endorse IPA activities for functional operation
C) Development of the stand-alone basis operations on each activities include financial management
D) Development of human resources to enhance all IPA activities

It is observed that the numbers of Membership increased by 92 (+18%) for individual members and 18 (+60%) for corporate members in last one and half year's period which illustrated effects of IPA activities. I would like to appreciate all Directors' positive efforts and contributions and I also would like to contribute myself to pursue the well-planned activities with a systematic and functional operation as IPA Secretariat.

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Special Contribution

2011 Great East Japan Earthquake Tsunami and Future Tsunami Disaster Mitigation

Dr. Masahiko Isobe
President, Kochi University of Technology
E-mail: isobe.masahiko@kochi-tech.ac.jp

The Great East Japan Earthquake Tsunami on March 11, 2011, caused unprecedented damage in northeast Japan. In the following, the characteristics and damage of the tsunami are described. It has been proved that coastal structures can reduce inundation depth and resulting damage even though the structures themselves are partially damaged. A new policy that has been adopted for recovery of the damaged area and for preparation for future tsunamis, especially Nankai Trough earthquake tsunami, is introduced. In the policy, development of resilient coastal structures plays a key role.

Keywords: Great East Japan Earthquake, Nankai Trough, tsunami, two-level tsunami disaster mitigation, resilient coastal structure

1. Tsunami Generated by Great East Japan Earthquake

Japan was attacked by the Great East earthquake on March 11, 2011 [1]. In particular, the tsunami generated by the earthquake caused devastating damage in the coastal area of northeast Japan. Figure 1 compares the maximum tsunami run-up heights in each city, town or village among the past three major tsunamis in the region. Red, blue and grey bars correspond to the Great East Japan earthquake tsunami, Meiji Sanriku earthquake tsunami in 1896 and Showa Sanriku earthquake tsunami in 1933, respectively. The heights of the Great East Japan earthquake tsunami are far higher than the other two tsunamis. Figure 2 compares the city of Rikuzen-takada, one of the most seriously damaged areas, before and after the tsunami [2], [3]. The city, which had 23,000 populations, was totally inundated and 1,800 people were killed or missing. The total number of deaths and missing in Japan is 22,118 as of March 1, 2017.

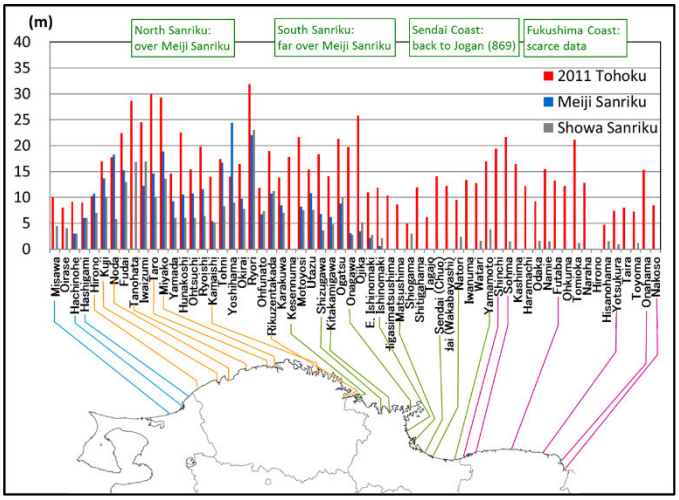

Figure 1 Run-up height of the Great East Japan earthquake tsunami in comparison with Meiji and Showa Sanriku tsunami

Figure 2 Damage due to tsunami (Rikuzen-takada City, Iwate Prefecture)

2. Damage and Effectiveness of Coastal Structures

Coastal structures were constructed as the first line of coastal defense. But, many of them were damaged by the tsunami.

Figure 3 shows the process of breaching of coastal dikes. In each photo, the right side is the bay side, and the left side the land side. When the tsunami came from the bay, compressive force act on the sea-side. But, the seaward surface withstood the pressure. However, when the tsunami overflowed beyond the dike, negative pressure acts on the landward side due to centrifugal force and flow separation. The negative pressure peeled off the surface concrete. Then the sediment was exposed to the flow and gradually flew out. Finally, the seaward concrete lost the support from the sediment and broken.

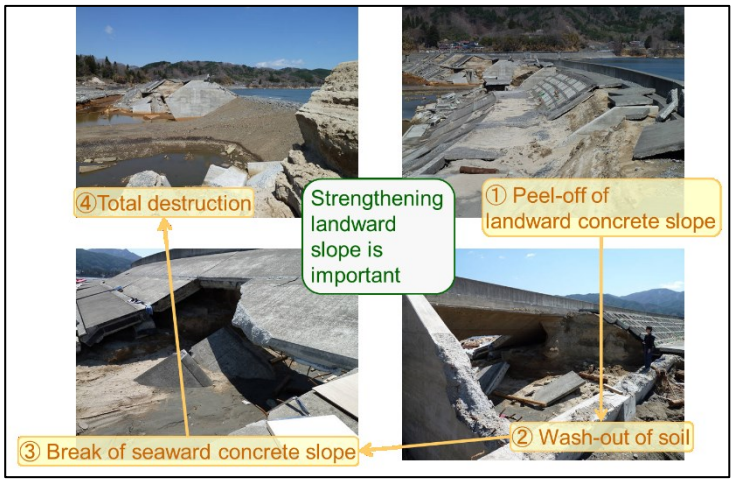

Figure 3 Process of breaching of armored sloping dikes

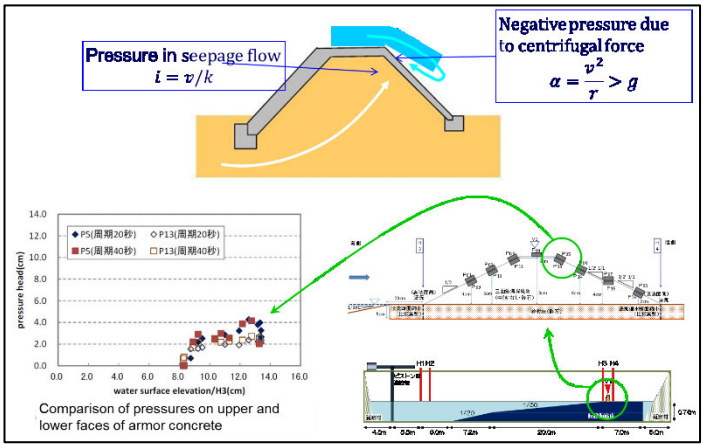

Figure 4 Possible reason for peeling of seaside concrete

This lead the dike to total breaching. Actually, experimental result shows the surface pressure on the seaward concrete drops significantly as shown in Fig. 4 [4]. This will trigger the breaching of coastal dikes. Therefore, the design standard has been modified to increase the thickness of concrete cover. Many other mechanisms for damage of coastal structures have been found through investigation after the tsunami.

In spite of the serious damage on the coastal structures, their effectiveness was also confirmed. In Kamaishi bay, offshore breakwaters were constructed for tsunami protection, but were seriously damaged by the tsunami. However, since 80% of the projected area of the structure remained, the arrival time was delayed by 6 minutes and the inundation depth was reduced by about half.

In Sendai Plain, the tsunami overflew and damage coastal dikes, but the inundation depth and area behind the dikes are similar to the result of computer simulation on assuming all dikes are sound rather than that without dikes. This means the overflow rate can be reduced significantly if sufficient projected area of structures is maintained.

3. New Policy for Tsunami Disaster Reduction

In recovering and reconstructing the damaged area, the first step is to establish a policy to construct the coastal structures that are the first line of the tsunami defense. Before the Great East Japan earthquake tsunami, the maximum recorded hazard level had been generally used as the design external force on the coastal structures. However, this is neither economical nor resilient to prepare for extremely rare and extraordinary hazard. In addition, high coastal structures disconnect the continuity of the land and sea, which results in serious adverse impact on the daily human life as well as the coastal ecology. A series of committees organized by Japanese Government established a policy of two-level tsunami disaster mitigation. For tsunamis of the maximum level, which is termed as level 2 tsunami and has a frequency of once in the order of one thousand years, we save all human lives by all means, mainly by evacuation. The Great East Japan earthquake tsunami is classified at this level.

For a lower tsunami with relatively high frequency, we design and construct coastal structures to protect land from inundation to protect assets as well as human lives. This is called level 1 tsunami and has the frequency of once in about one hundred years, i.e., once in a lifetime. This means that structures may experience tsunamis over the design level.

Therefore, the design standard requires coastal structures be resilient to avoid total corruption even by tsunamis of over-design level. In the area damaged by Great East Japan earthquake tsunami, reconstruction of coastal structures has almost completed according to the policy.

Figure 5 summarizes this tsunami disaster mitigation policy. Even when a tsunami over the design level attacks, coastal structures can defend until the highest part of the tsunami arrives. During this period, people are to evacuate to the safest places among high ground and tsunami evacuation buildings, towers, and shelters. In addition, even if the tsunami overflows, the coastal structures can decrease flow rate and inundation depth, and as a result reduce damage.

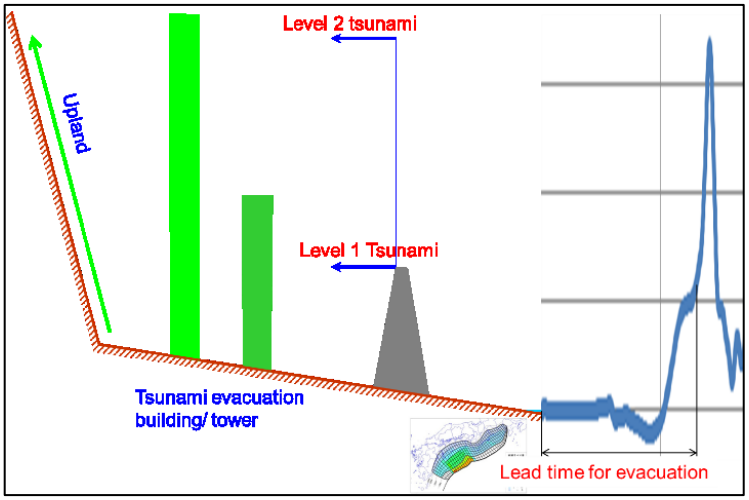

Figure 5 Tsunami disaster mitigation policy

4. Preparation for Future Nankai Trough Earthquake Tsunami

The policy is now being applied not only to the damaged areas but also to all other areas in Japan. Kochi prefecture is being threatened by a giant tsunami generated by the Nankai Trough earthquake. The highest run-up height is simulated as high as 34m. However, in central and eastern coast, the crown heights of the coastal dikes and seawalls are enough to protect from level 1 tsunamis because they have already been constructed for protection against storm surges which are very severe due to frequent attack of strong typhoons. But, to meet the two-level tsunami mitigation policy, they must be improved to avoid subsidence due to liquefaction and to increase resilience. Reinforcement by double sheet piles is suitable for this purpose. Figure 6 shows the sketch of improvement of the dike [5].

When a tsunami of the maximum level attacks, improved structures can save enough time for evacuation. During the time, people can climb up high lands or tall buildings. In the area where they are not available, tsunami evacuation towers as shown in Figure 7 have been constructed. Thus, the two-level tsunami disaster mitigation policy is being implemented in Kochi.

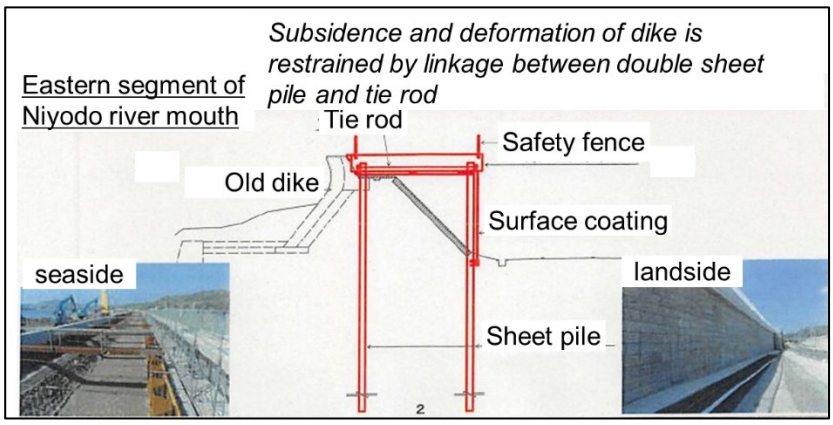

Figure 6 Reinforcement of coastal dikes by piles

5. Conclusion

The first priority in tsunami disaster mitigation is to save all human lives. In parallel to this, economic damage should be minimized. In this respect, the two-level tsunami disaster mitigation policy is effective and flexible to implement. If regional economy does not allow to construct high quality coastal structures, level 1 tsunami can be modified to be lower so that the policy becomes feasible to implement. Finally, development of resilient coastal structures is a key to establish successful disaster mitigation system.

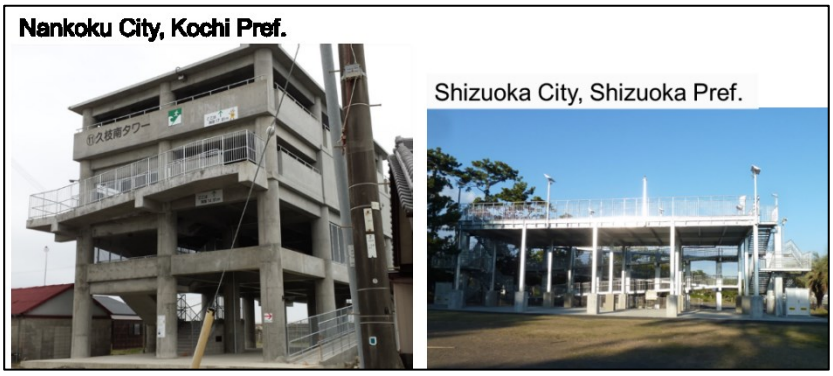

Figure 7 Tsunami evacuation tower

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[1] Sato, S. ed., "Special Anniversary Issue on the 2011 Tohoku Earthquake Tsunami," Coastal Engineering Journal, Vol. 54, No. 1 (12 papers), 2012.

[2] Joint Survey Group for Great East Japan earthquake tsunami, http://www.coastal.jp/ttjt/, April 30, 2011.

[3] Watanabe, H., "List of Disastrous Tsunamis in Japan,", Univ. Tokyo Press, 238p. 1998. (in Japanese)

[4] Kotake, Y. and M. Isobe, "Experimental study on pressure distribution along landward slope of coastal dike due to tsunami overflow," J. JSCE, Ser. B2, Vol. 68, pp. 891-895, 2012. (in Japanese)

[5] by courtesy of Seacoast Office, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism.

◆A brief CV of Dr. Masahiko Isobe

Masahiko Isobe obtained doctoral degree in 1981 in the field of coastal engineering at the University of Tokyo. He worked at Yokohama National University from 1981 to 1987 as Assistant Professor and Associate Professor. He also worked at the University of Tokyo from 1987 to 2013 as Associate Professor, Professor and Vice President. Then he moved to Kochi University of Technology as Vice President, and has been serving as President since 2015. Based on his research career, he took a leadership role at national level in recovering from the damage due to the Great East Japan Earthquake Tsunami.

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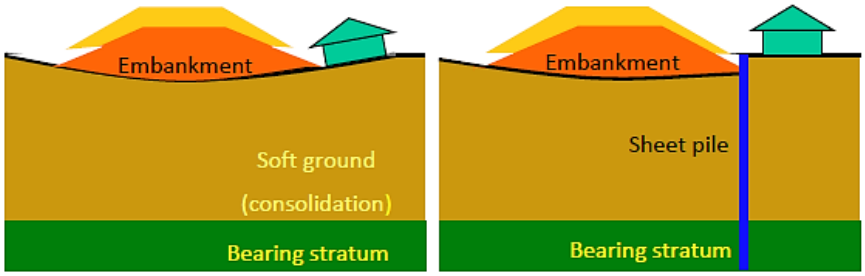
Report

A new steel sheet-pile method for countermeasures against the settlement of embankment on soft ground -Development of PFS Method-

Prof. Jun Otani
Kumamoto University, Japan

1. Introduction

When the embankment is constructed on soft ground, the ground subsidence for not only the ground under the embankment but also the ones around embankment are serious problems and some countermeasures have to be considered. A steel sheet-pile method is one of the countermeasures for this problem as shown in **Figure 1**. However, this type of structure has a cost problem when the area and depth of soft ground are wider and deeper, so that a new sheet-pile method has been expected.



(a) Without countermeasures (b) With sheet-pile countermeasures

Figure 1 Sheet-pile countermeasures

In 1975, a collaborative research started between Kyushu University and the Ministry of Construction (Ministry of Land, Infrastructure, Transportation and Tourism at present) in Japan. Under this collaboration, a series of in-situ full scale tests were conducted in Kyushu area. Based on those activities, a research committee for developing a new sheet-pile method was established in 2003 (the chair is Prof. Hidetoshi Ochiai, Professor Emeritus of Kyushu University, Japan). In 2005, a new sheet-pile method called PFS method (Partial Floating Sheet-pile) was proposed under the activities of this committee. In this method, the end bearing sheet-pile and that of floating type were combined to deal with its effectiveness and cost as shown in **Figure 2**. **Figure 3** shows the details of this structure. In this report, this PFS method is briefly introduced.

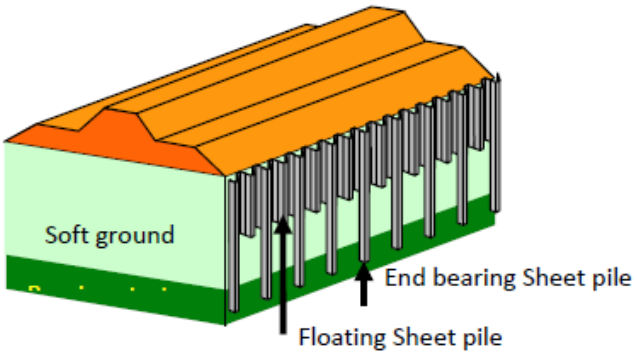


Figure 3 PFS method

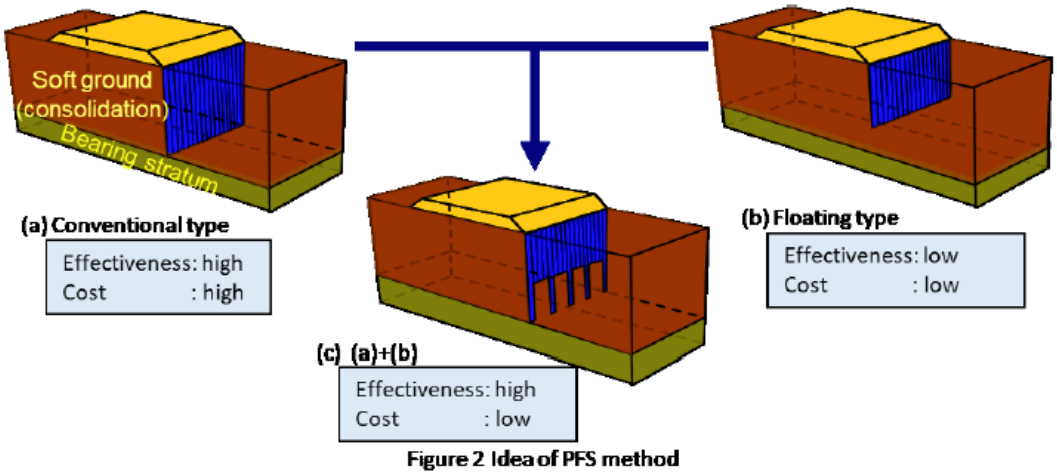


Figure 2 Idea of PFS method

2. Performance of PFS method at the site

As mentioned before, a large number of in-situ full scale tests were conducted in Kumamoto City, Japan. This area is well known as a region of Ariake Clay which is a highly sensitive clay and its depth is up to 40m. **Figure 4** shows the soil profile at the site of in-situ test for PFS method. In this case, one end bearing sheet-pile for five floating sheet piles were constructed. **Figure 5** shows the results of measurement for the settlements at the site and as easily realized, the effectiveness of the PFS method is clearly shown. **Photograph 1** shows the view of the site after PFS construction. Since a large volume of sheet-pile materials were reduced, the cost of the PFS method is obvious and the construction time is also highly reduced because of the less volume of the sheet-piles.

Photograph 1 After the PFS construction

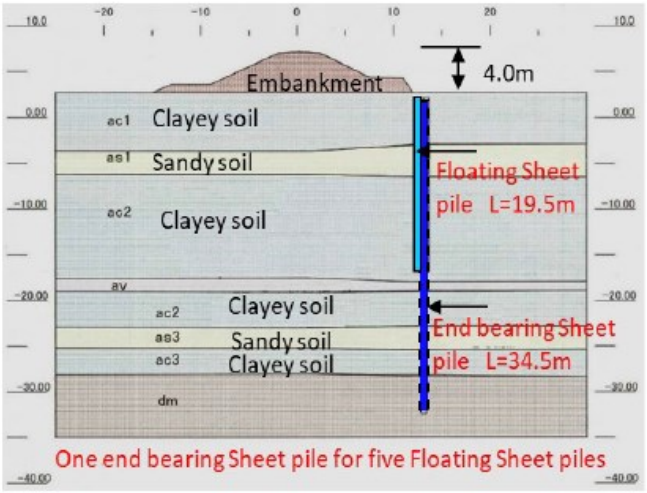


Figure 4 Ground condition at the site

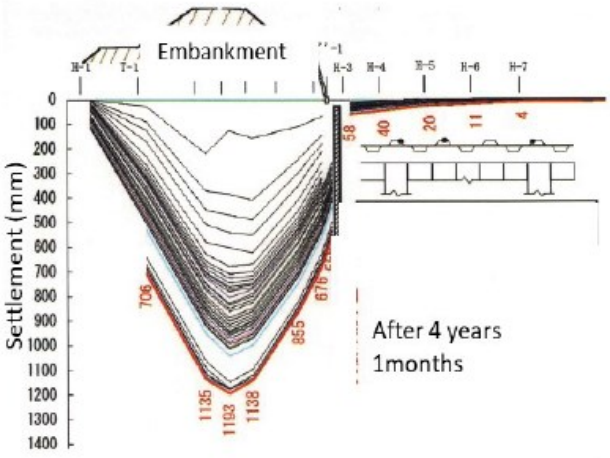


Figure 5 Results of measurements

3. Numerical Modeling

A series of numerical modeling was conducted. Here, because of the shape of PFS method, three dimensional FE analysis was conducted as a consolidation problem. **Figure 6** shows the 3D mesh for this analysis and the results such as total settlement and pore water pressure change in ac.1 layer as shown in **Figure 4** were compared with the measurement results as shown in **Figure 7**.

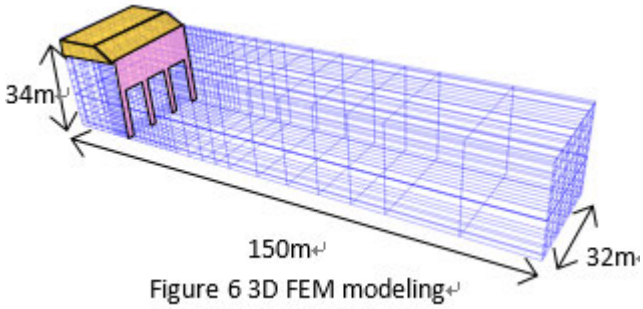
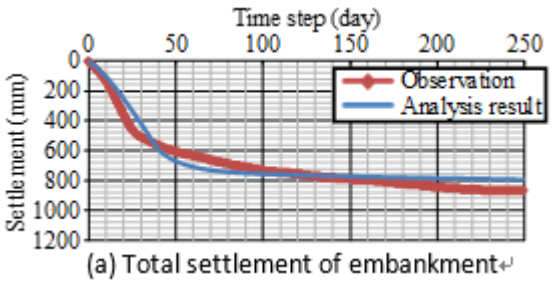


Figure 6 3D FEM modeling



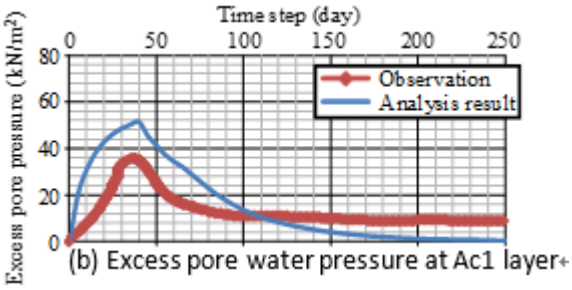


Figure 7 Simplified design model

4. Design Procedure

Under the activities of the research committee of the new sheet-pile, a simple design method was proposed in 2007 and this idea is shown in **Figure 8** which is the combination of spring with beam elements. The basic idea is the consideration of only vertical displacement.

5. Closing Remarks

A summary of the development of PFS method was briefly introduced. The quantification of this method was also done by in-situ test and numerical modeling, and to design this method, a simple model was proposed.
However, as shown in **Photograph 2**, sheet-pile method has been used for more and more for the permanent structures, so that the upgrading of the method is indispensable such as the behavior under earthquake. The potential of liquefaction is also the one for checking at the site. Under those circumstances, IPA has recently started a technical committee for the steel sheet-pie (TC-3) and within three years (2017-2019), a total of 20 members around the world joined this committee to discuss what we have to do for upgrading the PFS method.

Finally, I would like to give my acknowledge to all the researchers and engineers who joined the development of PFS method such as the research committee members in 2003 including the members from the Ministry of Land, Infrastructure, Transportation and Tourism, and the members of Japanese Association for Steel Pipe Piles.

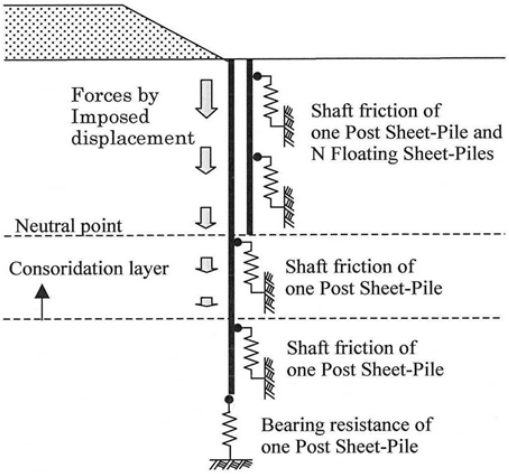
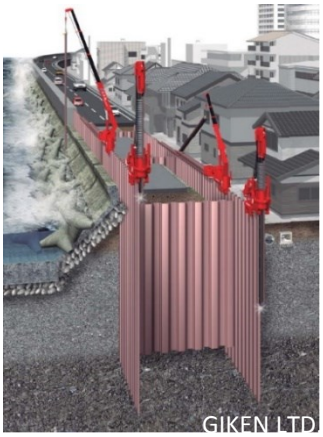


Figure 8 Simplified design model



Photograph 2 Recent sheet-pile method

◆ A brief CV of Prof. Jun Otani

Prof. Jun Otani is a full Professor of Geotechnical Engineering at Kumamoto University, Japan and he is the immediate past Vice President of the Japan Geotechnical Society. He is also the Director of IPA and chair of TC-3 (sheet-pile). He got his master at Nagoya University, Japan and moved to U.S.A. for Ph.D. study. He got his Ph.D. at the University of Houston, TX in 1990. His research was pile foundations as his Ph.D. study and later, he has done many research activities on soil reinforcement. In fact, he was the organizing committee chair of the 15th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering under ISSMGE in 2015. Recently, he deeply involves the research on the application of X-ray CT in geotechnical engineering. He established the international society called IntACT and plays a role of the Vice President.

Announcement

IPA Seminar on Press-in Technology in Malaysia

IPA Secretariat

As reported that IPA held the seminar on Press-in Technology in Singapore, 2nd March in IPA Newsletter Vol.1, 2, we will hold the seminar of the same contents in Malaysia, 1st November as follows. The seminar will introduce the "Press-in Retaining Structures: A Handbook (First Edition 2016)" which brings together useful information related to the design and construction application examples of retaining structures by the Press-in technology from all over the world. We are sure that you will have a memorable seminar, we are looking forward to you attending the seminar.

Date : **1st November 2017, Wednesday [09:30– 16:30]**

Venue : **Hotel Maya Kuala Lumpur**

Address : 138, Jalan Ampang, 50450 Kuala Lumpur, Malaysia
(Map: http://www.hotelmaya.com.my/about-us/location)

Program : 09:30 ～ Registration
10:00 ～ 12:55 Seminar (4 Invited Speakers, and concluded in a Forum)
12:55 ～ 14:00 Lunch (Buffet)
14:00 ～ 16:30 Site visit (subject to availability of jobsite)

Speakers : Professor Dr. Wahid bin Razzaly (Vice Chancellor, Universiti Tun Hussein Onn Malaysia)
Dr. Asnor Muizan bin Dato' Hj. Ishak & Ir. Arman Bin Mokhtar
(Department of Irrigation and Drainage Malaysia)
Prof. Kikuchi Yoshiaki(Professor, Tokyo University of Science)
Mr. Ryo Kamioka(Manager of Giken Seisakusho Asia Pte., Ltd.)
Ir. Dr. Goh Teik Lim (Director, AtsuNEW GIKEN)Professor

Registration fee : JPY7,000 (approximately 285MRY) per person (Buffet lunch will be provided)

Registration : The registration form can be downloaded from IPA Website

Payment Method : Online Payment (PayPal) (Account details to be advised upon confirmation of attendance.)

CPD/CCD Points : This event is qualified for the following programs.
CPD offered by IEM (The Institution of Engineers Malaysia)
CCD offered by CIDB (Construction Industry Development Board Malaysia)

Note : A soft copy of the handbook shall be distributed to every participant.

Organizer : IPA Local Organizing Committees

Co-organizer : Universiti Tun Hussein Onn Malaysia (UTHM)

Honorary Chairman : Tan Sri (Dr.) Ir Jamilus bin Md Hussin

Committee Chairman: Dr. Nor Azizi bin Yusoff, IPA director

Co-Chairman : Mr. Tsunenobu Nozaki

Supporters
- Universiti Tun Hussein Onn Malaysia (UTHM) (http://www.uthm.edu.my/v2/)
- Department of Irrigation and Drainage Malaysia(http://www.water.gov.my/)
- Public Works Department(http://www.jkr.gov.my/)
- Malaysia-Japan International Institute of Technology (MJIIT), Universiti Teknologi Malaysia Kuala Lumpur(http://mjiit.utm.my/)
- Research Centre for Soft Soil(RECESS) (http://recess.uthm.edu.my/)
- KLIA Premier Holdings Sdn. Bhd. (http://www.kliaholdings.com.my/)
- Malaysian Hydrological Society
- Koye (M) Pte. Ltd.(http://www.koye.com.my/)
- Giken Seisakusho Asia Pte.,Ltd.(https://www.giken.com/en/)

*In random order

JABATAN PENGAIRAN DAN SALIRAN MALAYSIA

Event Report

10th IPA Press-in Seminar 2017 in Kochi held in July

Mr. Masafumi Ymaguchi
IPA Secretariat

The 10th IPA Press-in Engineering Seminar in Kochi was held on 20 July 2017 and 294 participants from 11 countries attended. The IPA Research Committee organised this seminar, with the support of the Kochi Prefecture Government, the Kochi Institute of Invention and Innovation, and ten other organizations.

Dr. S Haigh

First of all, Dr Stuart Haigh, a senior lecturer at the University of Cambridge, delivered the opening address. In his speech, he mentioned the importance of the IPA's activities by comparing Implant structures created by Press-in technique with conventional coastal structures during the 2011 Tohoku Earthquake.

Then, four interesting lectures were presented, "Singapore Experiences in Press-in" by Prof. Leung Chun Fai of the National University of Singapore, "Tubular Pile Press-in Method, Press-in Method Application in Bangladesh" by Mr Tsunenobu Nozaki of GIKEN LTD., "Development of a New Steel Sheet-pile Method for the Settlement of Embankment -PFS method-" by Prof. Jun Otani of the Kumamoto University and "Development and Construction Examples of Sheet Pile Foundations" by Dr. Hidetoshi Nishioka of the Railway Technical Research Institute. The main contents of the 3rd presentation (Prof. Otani) are reproduced in this issue of the IPA Newsletter. Additionally, the remaining three presentations are scheduled to be accordingly reproduced in the following issues.

Dr. H. Nishioka

Finally, to close the conference, Mr Ishihara of the IPA director summarized each presentation and announced two technical committees held on the next day, as well as the 1st International Conference on Press-in Engineering 2018 (in short, ICPE2018) in Kochi, Japan.

Overview of IPA Press-in Seminar

Report

The IPA Board of Directors Meeting

IPA Secretariat

IPA Board of Directors meeting was held on Thursday 20th July 2017 at Sunpia Chres, Kochi, Japan and the meeting achieved a quorum with 14 Directors' attendance out of 24 Directors on the board in accordance with Article 19 of the amended Constitution. The meeting was chaired by the IPA President, Dr. Kusakabe and discussed the following agendas.

Reports on:

1. The Ordinary General Assembly held in June 2017 with a summary explanation of the resolved Agendas
2. Introduction of the newly elected Directors and Auditors
3. Summary explanation on amended Constitution with adoption of proposed By-laws and Regulations

The Board of Directors meeting

Progress reports on:

1. The Technical Committees (TC1, TC2 and TC3) by each Chair
2. The proposed **1st International Conference on Press-in Engineering 2018** (1st ICPE 2018)
3. Revisions and multilingualization on the Press-in Handbook
4. Summary explanation of the first Press-in Handbook seminar in Singapore held in March 2017
5. The next proposed Seminar to be held on 1st November in Kuala Lumpur, Malaysia
6. IPA Newsletter publications and IPA web site renewal (Phase I) process with an adoption of the credit card payment function
7. Leaflet renewal on IPA Prospectus and Membership Application

Discussed and resolved matters:

(Note: Some items shall be re-affirmed subject to reconsideration based on discussions)

1. Adoption of By-laws and Regulations to Constitution
2. Four categories of Corporate Membership are adopted with graded annual dues defined in By-laws and Regulations
3. Election of five Vice Presidents
4. Nomination and appointment of Chairs and Co-chairs for each Technical Committee (TC) (Terms of reference on each TC will be finalized by Chair and Co-chair)
5. Appointment of Chairs and Co-chairs for five Standing Committees (Research/Award/Publicity/Development /Administration)
6. Appointment of the Secretary General and Secretariat members

Group photo

Next meeting:

The next Board of Directors meeting is planned to be held in September 2018 prior to the 1st ICPE 2018 in Kochi and notification will be announced in due course

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Group photo

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Report

The Museum of Pile Drivers opens in Kochi, Japan

Ms. Rie Kanbara
General Affairs Section
GIKEN LTD.

Photo1 a view inside the museum

GIKEN LTD. (Hereafter, GIKEN) unveiled the Museum of Pile Drivers at a ceremony which celebrated the "fiftieth foundation" and "listing on the Tokyo Stock Exchange 1st section" on 25th July 2017. There are 26 valuable pile drivers collected from all over the world at the headquarters of GIKEN in Kochi, Japan, from which we can learn the history of pile drivers and piling methods.

Piling is essential for infrastructure: to build foundations, retaining walls and cofferdams. In the past, conventional piling works caused severe construction pollution (excessive noise and vibration), in contrast to the development of the modern state. However, in 1975, the Silent Piler was developed by GIKEN as the world's first "reaction based" hydraulic sheet pile machine. Since then, construction pollution has been greatly reduced and GIKEN has been pioneering new use of pilers.

Traditional, rare, and valuable pile drivers (i.e. the diesel hammer, steam hammer, vibratory hammer, earth auger and other apparatuses) collected by Mr Akio Kitamura (President of GIKEN and Honorary President of International Press-in Association) in the world, as well as the initial Silent Piler and thirteen representative models which introduce both the environmentally-friendly technique and the IT function, are on display. Moreover, the full-scale soil investigation rig re-produced from the drawing by Leonardo da Vinci is displayed and visitors are able to learn about the past, examine the present and look into the future of piling there.

GIKEN is prepared to expand and improve the collection at the exhibition facility as well as supplementary materials, and aims to have open days for the public as well as people involved in the construction industry.

◆ Some comments from Visiters

Photo2 the signboard of the museum

1 For me, Museum of Pile Driver is an expression of evolution in piling technologies. It is there to highlight the past, present and the future of this technology. Therefore, it such a privilege to visit this museum!

From Dr. Nor Azizi Bin Yusoff (Malaysia)

2 I got the opportunity to visit "World Pile Driving Machine Museum" newly established in GIKEN LTD.. Since I had few opportunities to see pile driving machines up close, the appearance of old and new machines were really impressive and overwhelmed. It was a very valuable time to see and feel the history of the progress of pile driving techniques.

From Prof. Kentarou Nakai (Japan)

History of Pile Drivers in the world

Around 1500

Da Vinci's Soil Investigation Machine

Pile driver reproduced from Da Vinci's design

Around 1720

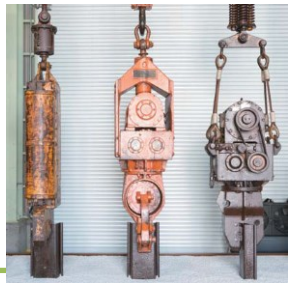
Drop Hammer Pile Driver

Drop hammer pile driver using steam power, among others

Around 1870

Steam Hammer

Impact driving systems with steam driven pistons



Around 1930

Vibratory Hammer

Vibration systems which drive piles using high frequency

Diesel Hammer

Impact driving systems using diesel engines

Around 1940

Continuous Flight Auger (CFA)

Machine that excavates and builds piles through augering

Around 1960

Pile Master

Multi-ram pressing machine with panel driving method

1975

Giken first Silent Piler KGK-100A

Founder' s Dreams come true - The 1st Silent Piler

Report

The Latest Model of Silent Piler

Mr. Toru Matsuoka

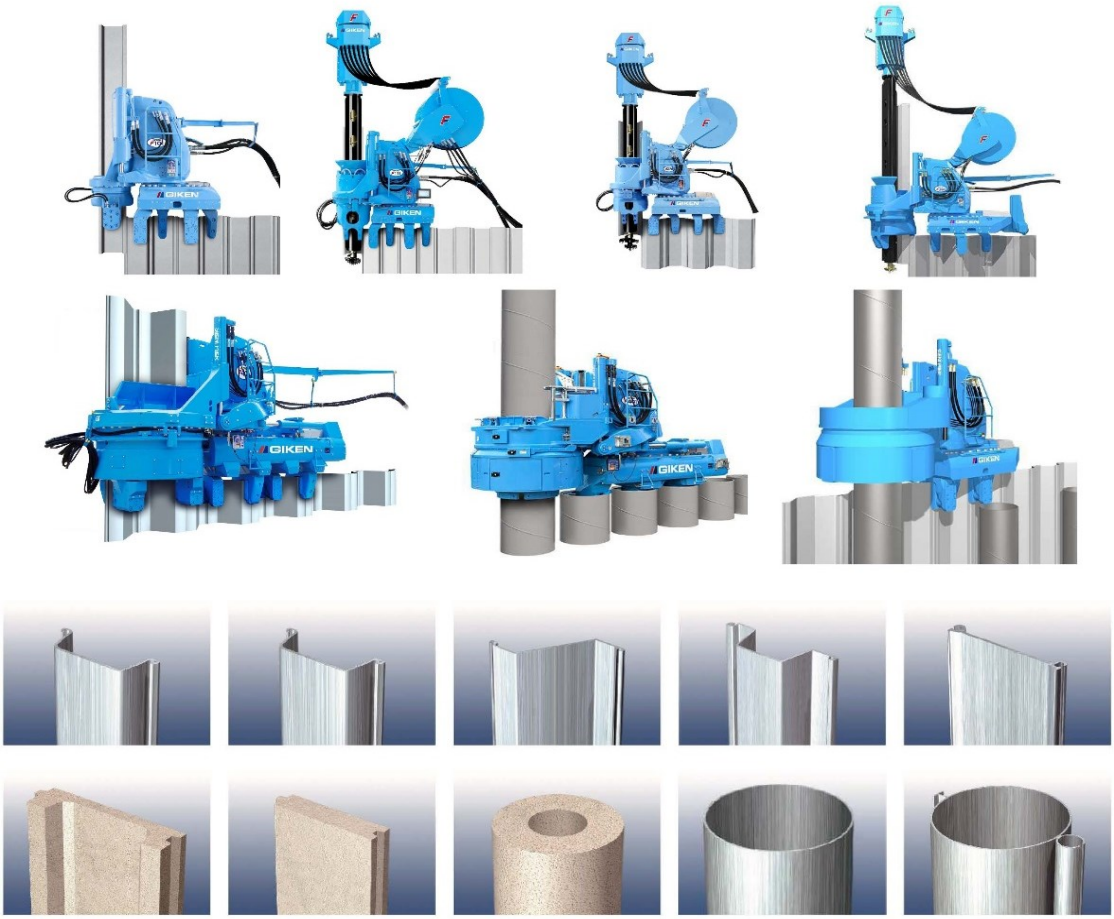
GIKEN LTD.

1. Outline

The Silent Piler “F series” is the next-generation model with not only an environmentally-friendly design and the same informatization-piling technology as the previous machines but also a new modular design in which all the component parts are standardized.

All parts have been properly adjusted after a thorough review of structures, shapes and materials. Moreover, the latest control system has been introduced, which can reduce any surplus load from the machine’s main body. As a result, high reliability and a long-life for the component parts has been achieved.

The Silent Piler “F series” can install a variety of pre-fabricated piles, sheet piles, tubular piles with/without interlocks and GIKEN Combi-Gyro walls (Picture 1). The use of the Silent Piler “F series” is currently expanding for oversea, river and bridge constructions due to the demand of “GIKEN Implant Structure”, which is a tenacious wall installed by the Press-in method, the necessary for disaster prevention and/or mitigation.



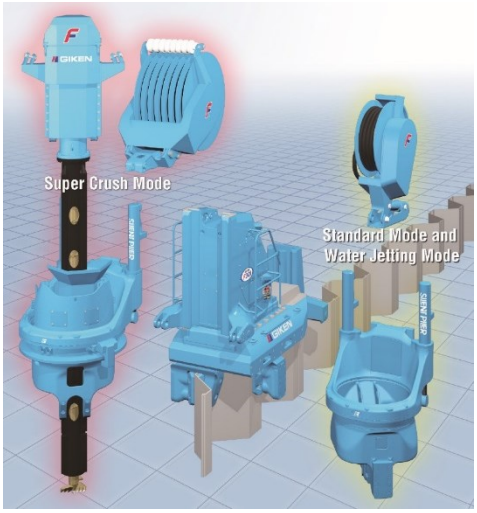
Picture 1

2. Features of production

1) Modular design

The Silent Piler “F series” is standardized and optimized based on the “modular design” reviewing all the component parts of each functional unit (Picture 2).

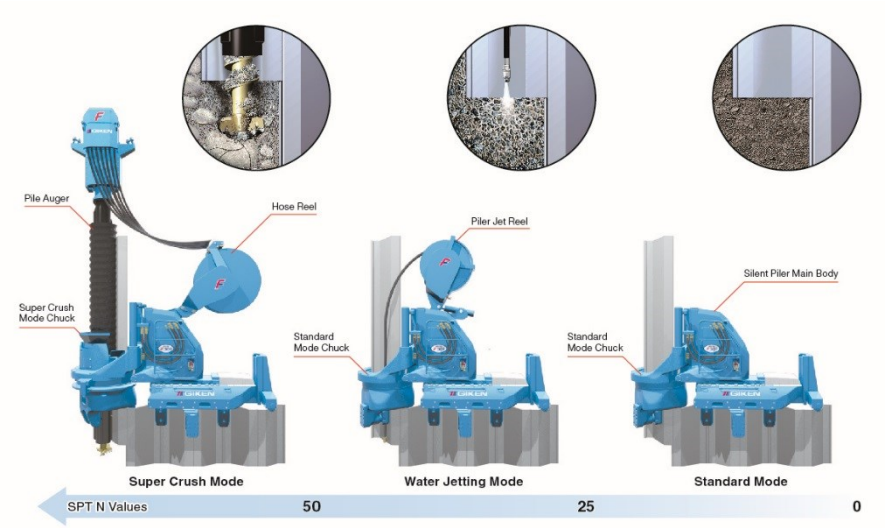
The standardization of all the parts contribute to the efficiency of development and production as well as the diversity of the production.



Picture 2

2) Optimising Work Efficiency with Modular Design

The Silent Piler “F series” is applicable to standard, water jetting, and super crush press-in works by changing the chuck and chuck frame, and adding attachments (Picture 3). The machine can be utilised more efficiently because it is adjustable to various soil conditions and working conditions.



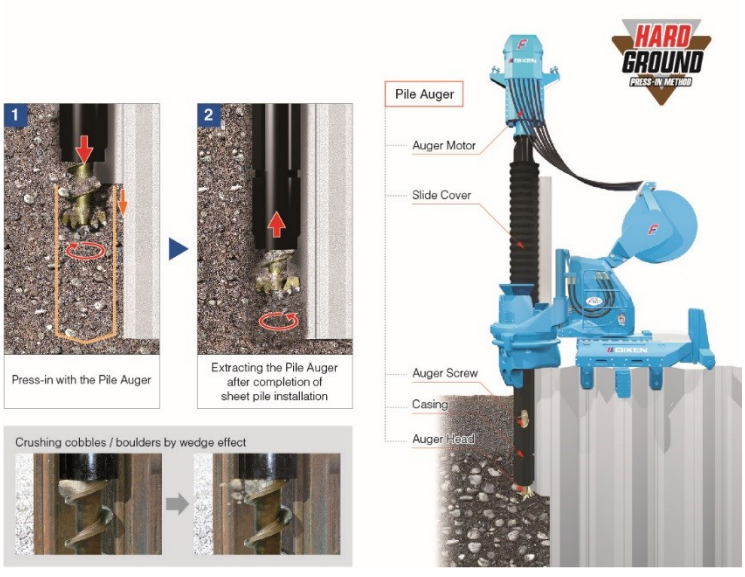
Picture 3

3) Longer Operational Life and Higher Functionality due to New Control System

The new control system manages the position of the press-in machine and controls load generation from press-in work during operation, maximising the durability of each part. Also, control of the machine is remarkably improved by the Press-in Force Control System and the Phase-less Linear Auger Torque Control System.

4) Pile Installation into Hard Ground

A) The "Directional Coring Theory", GIKEN's original theory, makes the Hard Ground Press-in Method able to install sheet piles into difficult ground conditions such as gravelly soil and cobble or boulder mixed soil without losing the advantages of the Press-in Method. The augering area can be reduced to assist pile installation, minimising the volume of spoil and disturbance to the soil strata. Hence, high bearing capacity is available for sheet piles which are installed by the Hard Ground Press-in Method.(Picture4)



Picture 4

B) Locking Function

Lock functions in the leader mast, chuck and clamps secure the Silent Piler against drilling torque and increase drilling efficiency and the accuracy of pile installation.

5) Outstanding Environmentally-Friendly Design

A) Low Emission Engine

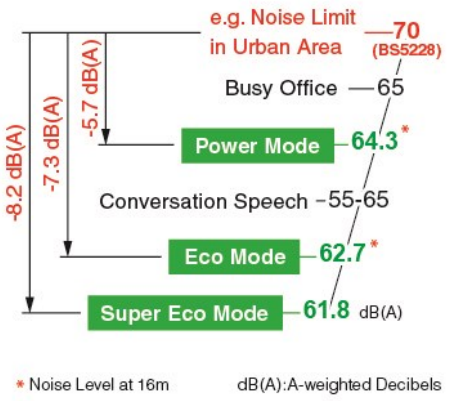
The latest Power Unit is a new generation model and has environmentally-friendly specifications.
It is designed with strict concepts for clean emissions with high combustion efficiency and GIKEN's original hydraulic control technologies.

B) Design of Ultra-Low Noise Level (Picture5)

It clears allowable construction noise levels in many industrialised countries.

- Super Eco Mode : 61.8 db (A)
- Eco Mode : 62.7 db (A)
- Power Mode : 64.3 db (A)

*Noise Level at 16m
*dB(A):A-weighted Decibel



Picture 5

C) Standard Application of Biodegradable Oil

The latest Silent Piler uses bio-degradable Piler Eco Oil and Piler Eco Grease. Hence, if hydraulic oil or grease is spilled into soil or water, there will be no environmental damage to the surrounding ecosystem. In addition, the machines are painted with TX-Free non-leaded paint*.

*Environmentally-friendly paint which does not contain toluene, xylene and lead based pigment.

6) Scientific Execution of Press-in Work & Advanced IT Functions

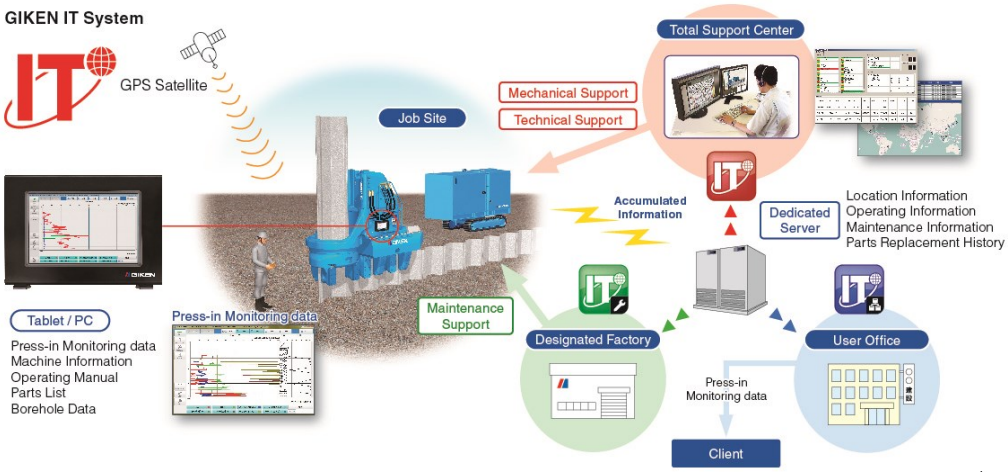
A) GIKEN IT System

GIKEN's engineers can monitor individual Silent Pilers, such as their operating condition, maintenance records and location. Quick advice for any technical troubles is available promptly and appropriate information can also be provided to prevent problems.

B) Press-in Monitoring and Data Logging System *Optional(Picture6)

Based on the accumulated ground data during the operation, the latest Silent Piler can automatically install the sheet piles with the PPTS which can select the suitable operation parameters (i.e. Press-in force, Extraction force, Stroke, Speed and Auger torque). It enables the standard operation to be reduced by 45 percent* in Press-in duration, which is expected to enable the elimination of labour, the accuracy of pile installation and safe operation.

*The reduction ratio was substantiated at the GIKEN test field.



Picture 6

Event Diary

■ IPA Events

http://www.press-in.org/events/calendar/en

IPA Malaysia Seminar
November 1, 2017 / Malaysia

International Conference on Press-in Engineering (ICPE) 2018, Kochi
September 19-21, 2018/ Kochi, Japan

■ International Society for Soil Mechanics and Geotechnical Engineering

http://www.issmge.org/events

The Third International Soil-Structure Interaction Symposium
October 18-20, 2017/ Izmir, Turkey

GEO-EXPO 2017 Scientific and Expert Conference
October 26-27, 2017/ Sarajevo, Bosnia & Herzegovina,

3rd International Conference on Ground Improvement and Ground Control
October 27-29, 2017/ Hangzhou, China

2nd PanAmerican Conference on Unsaturated Soils
November 12-15, 2017/ Dallas, United States

Second International Conference "Challenges in Geotechnical Engineering" 2017
November 20-23, 2017/ Polish, Ukrainian

2nd International Symposium on Asia Urban GeoEngineering
November 24-27, 2017/ Changsha, China

■ Deep Foundations Institute

http://www.dfi.org/dfievents.asp

DFI-India 2017: 7th Conference on Deep Foundation Technologies for Infrastructure Development in India
October 5-7, 2017/ Chennai, India

DFI-SMIG-GI-ISSMGE 4th International Conference on Deep Foundations
November 15-16, 2017/ Mexico City, Mexico

The International Foundations Congress and Equipment Expo (IFCEE 2018)
March 5-10, 2018/ Buena Vista, Florida

■ Construction Machinery Events

Edifica 2017
October 4-7, 2017/ Espacio Riesco, Chile
http://www.feriadelaconstruccion.cl/

Infra Oman 2017
October 9-11, 2017/ Muscat, Oman
http://www.infraoman.com

UK Construction Week 2017
October 10-12, 2017/ Birmingham, UK
http://www.ukconstructionweek.com/

The Big 5 Construct Indonesia 2017
November 8-10, 2017/ Jakarta, Indonesia
https://www.konstruksiindonesiabig5.com/

EXCON 2017
December 12-16, 2017/ Bengaluru, India
https://www.excon.in/

■ Others

International Disaster and Risk Conference (IDRC) 2017
November 25-27, 2017/Sendai. Japan
https://idrc.info/2017/

New Corporate Members

上海隧道工程股份有限公司

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1009 South Wanping Rd.Xuhui District,
Shanghai 200232
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Xiuxiang avenue, Xixiangtang district
Nanning city, Guangxi 530001,
CHINA

SHANGHAITRUST MACHINERY IMPORT & EXPORT Co., Ltd.
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No. 145 PuJian road , Pudong District ,
Shanghai CHINA

NARASAKISANGYO CO., LTD.
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Tokyo 104-8530,
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Tokyo 114-0002
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Australia

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Towada-shi, Aomori, 034-0102,
Japan

JFE Steel Corporation
Hibiya Kokusai Bldg., 2-3,
Uchisaiwai-cho, 2-chome,
Chiyoda-ku, Tokyo 100-0011,
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YONEI& CO., LTD.
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Tokyo, 278-0002
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THL FOUNDATION EQUIPMENT PTE LTD
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AICHI-PREF., 474-0071
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Hiroshima Naka-ku,Hiroshima,730-0015,
JAPAN

New membership categories for corporate members since the fiscal year of 2017
(See P13 of this issue)

Type of Membership	*Categories*	
Corporate Members	I)	Platinum Member
	II)	Gold Member
	III)	Silver Member
	IV)	Bronze Member
Note: No changes are applied to Individual Members and Student Members.		

Editorial Remarks

The Editorial Board is pleased to publish Volume 2, Issue 3 on schedule. This issue contains messages from 2 new presidents, a case history from Kochi seminar, and several reports. IPA will hold the Press-in Engineering seminar in Malaysia on 1 November, please read the details on the announcement.

This issue also includes a special contribution about the Great East Japan Earthquake in 2011 and mitigation of future disaster written by Dr. M. Isobe the president of Kochi University of Technology.

Please feel free to contact the Editorial board members below with email address or IPA Secretariat (tokyo@press-in.org) for your clarifications and/or suggestions.