

On-site Interview

Gyropress (Rotary Cutting Press-in) Method in Disaster Recovery Project (Kagoshima Prefecture, Japan)

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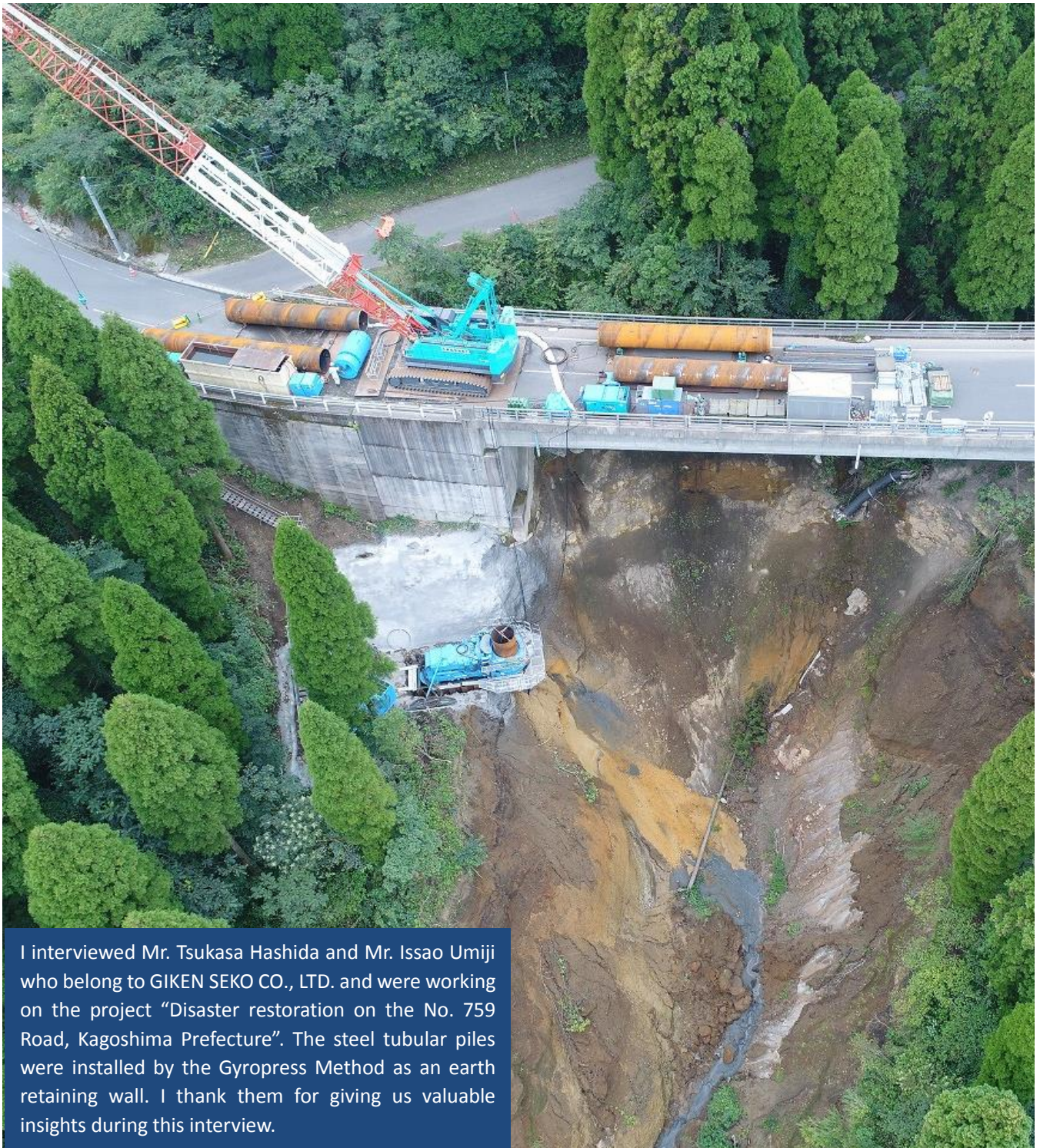


Photo 1 Construction overview

Profile of Mr. Tsukasa Hashida, Project Manager of GIKEN SEKO CO., LTD.

Mr. Hashida entered the GIKEN Group in 1979. Until now, he has been operating various models of Silent Piler including the KGK-100D which was firstly sold in 1978. He has worked on many sites for 38 years and has been engaged in the Press-in Method such as the Hard Ground Press-in Method, the Gyropress Method and others. He was the prime operator in this project. He has qualifications of “First-class Civil Engineering works Execution Managing Engineer”, “First-class Press-in Operation Engineer”, the licenses for various cranes and etc.



Profile of Mr. Issao Umiji, Project Manager of GIKEN SEKO CO., LTD.

Mr. Umiji has been working for GIKEN Group since 1980 with 11 year experiences in the Press-in Method such as the Gyropress Method, the Hard Ground Press-in Method and others. He had experiences of working on abroad such as Asia and Europe. He was responsible for operating in this project. He has the qualifications of “First-class Civil Engineering works Execution Managing Engineer”, “First-class Press-in Operation Engineer”, the licenses of various welding and etc.



Q1. Please tell us about the background and summary of the project.

Mr. Hashida: In June 2016, a heavy rainstorm occurred in Kyushu region in Japan, which caused serious flooding and overflowed their banks and flooded neighboring areas. Furthermore, there occurred serious flow disasters. This construction site is at the Udo Bridge located on the Kagoshima prefecture road 72. The massive landslide around the abutment occurred due to the heavy rain, eventually (Photo 1). This is a disaster recovery project conducted by the Gyropress Method, preventing the bridge abutment from collapsing.

Q2. Can you tell us why the Gyropress Method was adopted and what the features of this construction?

Mr. Umiji: The key feature of the project was to use the “Non-staging Method”, which could work on a slope near the bottom of the bared abutment (Photo 2). If the conventional construction method had been adopted, it should have built an embankment and a temporary platform as a working space on the eroded slope firstly. Then the installation of the steel tubular piles were carried out. Actually, the Non-staging method does not require temporary works, meaning that additional works are not necessary. Due to the advantages of the Non-staging Method (i.e. short construction period, low cost and safety), our proposal was adopted.



Photo 2 Non-staging Method

Q3. Was the project completed in accordance with the plan? If there were any difficulties, can you tell us about it and how did you solve it?

Mr. Hashida: The press-in operation for which we were responsible was successfully completed (Photo 3). I think the most difficult thing in this operation was to decide the installation line. The longest steel tubular pile was as long as 24.5m, which the projecting length was 9m from the ground surface to the pile top (Photo 4). There was nothing around the steel tubular pile above the ground, it was very difficult when we decided the installation line. This was also the curve piling, and the angle of the installation line between adjacent steel tubular piles was different. In a narrow area with a radius of 10 meters, the operation was really tough. We used the pile laser to determine the location of the piles with the main contractor. It took 4 hours to fix the location of a steel tubular pile.



Photo 3 A view of after Press-in operation



Photo 4 Construction yard



Photo 5 Water lubrication System

Mr. Umiji: I also think it was difficult to decide the installation line. One of the reasons for the difficulty was that we did not have the soil data, so we could not assume underground conditions before the installation. At the beginning of the piling work, the steel tubular pile hit hard rock in a shallower place where we did not anticipate the existence of it. We used the water lubrication system which can reduce pile toe resistance and the plugging inside the steel tubular pile (Photo 5). But when we used the water lubrication system, the sludge, which soil and water were mixed, was discharged to the foot of the mountain. Because there were farmland at the foot of the mountain, so the main contractor had to conduct the turbid water treatment. The turbid water treatment was not directly involved in the procedure of the press-in operation for which we were responsible, however, the duration of the project was extended.

Q4. Please share with us your impressive experience.

Mr. Hashida: The most impressive experience was that I drove the Silent Piler firstly when I just entered the company. Our company firstly sold the KGK-100D model of Silent Piler in 1977 (Photo 6). My first press-in operation was to drive this Silent Piler. At that time, the maximum SPT *N* value in the soil boring log was only about 10, which I considered that the operation should be easy. But when the Silent Piler pressed-in the steel sheet pile to about 10m deep, the machine tilted forward and it was difficult to continue the operation. At that time, I didn't know how to recover the situation because there were not any construction manuals. This experience was very remarkable to me. Now, a variety of machines have been manufactured, and the automatic driving system has become real. I really amazed the rapid progress of Press-in Technology.



Photo 6 KGK-100D
type of Silent Piler

Mr. Umiji: For me, the experience of the first overseas construction in 1983 was the most impressive. In fact, this construction was also the first achievement of the Press-in Technology used overseas. The place of the construction was in Giessen city, Germany. The project was to build a new city government office, and the Press-in technology was utilized to construct the retaining wall of the office building. Because I was only one Japanese on the site in Germany, I had a strong anxiety about language and culture. And the ground condition of the site was very stiff, overall, the piling progress was not very smooth. Through the interpreter to help me to train the local staffs, we completed the project with our local staffs together.

Q5. Were there any differences when you operated in Germany?

Mr. Umiji: Yes. I think there is a great difference between the working culture of Germany and Japan. In Germany, the break time was clearly defined. Even when the installation into the ground was undergoing, if it comes to the break time, they had a break immediately. If this happens in Japan, Japanese labors should have a break after the completion of the installation. Because I didn't know the culture, the progress of the project was not the way I expected. I think it's important to understand different local culture and rules in overseas constructions.

Q6. What is your prediction about the future of the Press-in Technology?

Mr. Hashida: I guess that fully automated operation will be true in 10 or 20 years. When I just entered the GIKEN Group, I had no operation manuals and learned the Press-in Technology through ten years of work. I think that the handbook will be improved, the technology of AI and mechanism will be evolved, and everyone will be able to be a good operator shortly in the future. I do not want young generation to spend 10 years, learning the Press-in technology like me. As you know, Japan's population is decreasing sharply. If the operation could be fully automatically conducted, it may solve the issue of insufficient labor population. And it could be safer to conduct even in dangerous places.

Mr. Umiji: In the future, I hope geological visualization can be achieved by using Press-in technology. Now, we do not know how the toe of the piling works, nor can we assume the underground obstructions. If you can watch the condition of the underground, the machine's autopilot technology should also improve faster. I don't know if it's going to come true, but for example, installing a small camera at the toe of the pile so that we can watching video while installing the piles.

★ Comments

This time I did not visit the site of the construction, but through the communication with the Mr. Hashida and Mr. Umiji, let me understood the whole situation of the project. Mr. Hashida has been in construction for 37 years, and he has been driving from the KGK-100D model of Silent Piler to the latest series of Pilers. It seemed to me that he grew up together with Silent Pilers to witness the history of Silent Piler's development. Mr. Umiji broke through the barriers of language and culture to complete the project in Germany by himself. I really admire his unremitting perseverance. I also felt strongly that in this construction, Mr. Hashida and Mr. Umiji made great efforts to achieve the project. I really thank them for giving us valuable insights during this interview.



Photo 7 The view of interview



Photo 8 Mr. Hashida is driving the Piler



Photo 9 Mr. Umiji is driving the Piler

I would like to express my sincere appreciation toward Mr. Hashida, Mr. Umiji and all who are concerned in this interview. Thank you so much.

We welcome the on-site operators who are able to accept the interview. If you have any questions, please contact to IPA Secretariat address to Ms. Hongjuan He (ipa.ka@press-in.org). We are waiting for you!