### **On-site Interview**

Tide Wall Reinforcement Work by Press-in Method (Keihin Canal, Tokyo)

> Hongjuan He, Secretary of IPA Yuta Kitano, Corresponding Member of IPA Japan Branch Office





### Koji Hamada Manager, GIKEN SEKO CO., LTD.

Mr. Hamada joined GIKEN in 1990. He had the 25 years' experience of the Press-in work at construction sites, including the 10-year-overseas work in the USA, Canada, Mexico, etc. He engaged in this site as Manager.



### Mizuho Yokoyama

Assistant Manager, GIKEN SEKO CO., LTD.

Mr. Yokoyama joined GIKEN in April, 1997. He has been engaging in all the Press-in Methods including "Hard Ground Press-in Method" and "Gyro Method" for 20 years. He engaged in this work as Main Operator.

### Q1. Would you please tell the outline of this construction work including the background?

Mr. Hamada: Tokyo Metropolitan Government is working on further reinforcing countermeasures against earthquakes, tsunamis and high surges for low and coastal areas. This construction site, the tide wall of Keihin Canal (1chome, Yashio, Sinagawa-ku, Tokyo) (Fig.1) is part of the tide wall reinforcement work. This is a very old tide wall constructed in 1963 by steel sheet piles and has been deteriorating as shown in Photo 2. It was required to build a new steel tubular pile revetment in front of the existing tide wall maintaining the current function of the tide wall, and it was decided to adopt a method to Press-in steel tubular piles for a new revetment (L=24.5m,Φ1,400mm,71piles) and steel sheet piles (L=18m,Φ900mm,17 piles). The construction was undertaken dividing the process into three steps as shown in Fig. 2.



Fig.1. Location of construction site

From Google Map



Photo 2. Tide wall constructed in 1963



Fig. 2. Construction plan

### Q2. What kind of technological features were there in this project?

Mr. Yokoyama: Two features can be pointed out. The first is that part of the construction of steel tubular piles was carried out under a limited overhead clearance of the metropolitan expressway and Yashio Bridge (Photo 3). In the case of driving piles under a limited overhead clearance, usually the length of a steel tubular pile is shortened and welding points are increased. However, if joint points are increased, the cost would rise and the construction period would be also prolonged. As a result of consideration, Y-jibu, a special attachment that our company developed, was adopted. Y-jibu which was used in this construction is a Yshape attachment that is attached to the toe of a hanging device which a Press-in machine for low overhead clearance is equipped with. The head is lengthened by pinching and raising steel tubular piles with a Y-shape hook on both right and left sides, and by using the lengthened steel tubular piles, it became possible to decrease the welding spots (Photo 4). The second is that, since the site was between the two bridges and the space for barges to put the equipment on was needed, it was quite difficult to secure the construction space in a narrow water area (Photo 5). That is why the GRB system that enables the equipment necessary for the construction to work on the completed piles was utilized. By constructing a continuous wall without temporary works, we were able to clear the problem of limited construction space (Photo 6).



Photo 3. Operating under Yashio Bridge



Photo 4. Low overhead type Piler with Y-jibu attachment



Photo 5. Construction view from a distance

## Q3. Was there anything you give a special consideration in the schedule of this project?

Mr. Hamada: In this construction, there were a lot of welding spots of steel tubular piles and it took much of the working time for welding. But we were able to shorten the process by increasing the number of welders and complete the construction two weeks earlier than scheduled. The completion of construction as shown in Photo 7.

#### Q4. Did you have anything you found problematic or difficult to deal with? What kind of measures did you take against them?



Photo 6. GRB System



Photo 7. Completion of Press-in operation

Mr. Hamada: We carried out the construction keeping the following two points in mind at this site. First one is schedule control. At this construction site, there were time zones when pile driving work could not be done on account of the tidal level, we checked the tidal level in advance and adjusted the working time in order not to have waiting time as short as possible. Second is the issue of environment maintenance in the vicinity of the construction site. In this construction, since all the work was done on the water, we were very careful about prevention of oil spillage. Specifically speaking, we tried locating hydraulic pressure hoses at the positions where they were seen all the time on the water using floats. If we leave the hydraulic pressure hoses in the water, it would become difficult to check the damage condition of the hoses, and consequently, to find the cause of oil spillage. That is why we made hydraulic hoses float on the water and conducted daily check of them.

Mr. Yokoyama: Since it was a construction work on the water, we set up a scaffold around the piles for moving and carrying (Photo 8). In this way, we laid a passage on both sides of the already completed piles so that we could go back and forth smoothly around the Press-in spots.

Q5. The construction industry is now actively working on the reform of working practices. Both of you have been working at construction sites for more than 20 years. Do you find any difference between the time when you joined the company and the present in terms of the way you work?

Mr. Hamada: Working long hours was common in the

construction sites in Japan 20 years ago. But our company tried hard to observe the five-day workweek and reduce the overtime work as much as possible by streamlining the



Photo 8. Scaffold

construction process, and thus we were able to make our company more appealing. Otherwise, young engineers and competent workers would not join us. As a manager, for instance, I am taking a measure by increasing people when necessary by grasping the workers' labor hours on-site.

Yokoyama: When I started working on-site, there was no working manual. It was common that we learn our job by watching the senior workers' way of working by ourselves repeating try & error on-site. Now it is possible that young generation people study the basics with the manual in the first place, then learn their work efficiently through OJT on-site.

## Q6. What does your company think about securing and cultivating young employees at this time of labor shortage?

Hamada: In our company, the average age of the employees who work on-site is over 45, and it is the actual situation that there are not enough middle-class personnel. It is becoming more and more important to secure and cultivate young operators. Also, since there is a big age difference between the senior workers and the young employees who work on-site, there is a generation gap which hinders communication between them. In order to solve this problem, we are working on establishing an OJT system to carry out cultivation young employees strategically. Under advice from an outside consultant, we are now introducing the "Career Plan", with which young employees can envisage their future, and also the "Skill Map", with which employees themselves check how they are improving themselves. At the same time, since the way of cultivating young people changes with the times, we give training for managers to teach how to cultivate young employees.

#### Q7. What do you think about the future of the Press-in technology?

- Yokoyama: I expect that the day will come some day when all the machines are completely automated and there is no need for an operator to operate a machine on-site. I myself felt that there is especially a high risk at the sites of disaster recovery through my many years' on-site experience. If the complete automation is realized, safe and efficient construction work can be undertaken even at the sites of disaster recovery. Using the on-site data which I collected for a long time in GIKEN group, I will work hard to realize automation as soon as possible.
- Hamada: I think in the future the Press-in technology will spread all over the world. With a population decline and aging, it is expected that the construction demand in Japan will decrease. I strongly felt that foreign people appreciate the Press-in technology highly while I was working abroad for ten years. I expect that we can contribute to the world by utilizing the Press-in technology in the countries and areas that have the problems such as earthquakes and tsunamis as well as Japan.

### $\star\star$ Comments $\star\star$

I was very surprised at the quietness of the construction site when I saw the photos where the children at a nursery school were playing joyfully without any affect by the construction noise or vibration. They were watching the construction very interestingly. While I was talking with two engineers, I strongly felt that both of them have strong confidence in the Press-in technology and also they were very proud of taking a leading part in making a contribution to the society. I was deeply impressed by their attitude to make themselves grow even further through cultivating young generation actively for the future world.

I would like to express my special appreciation to Mr. Hamada and Mr. Yokoyama, who gave their kind response to our interviews for the second time, and the Toyo Construction Co. Ltd., the prime contractor, and the people concerned for their cooperation.



Photo 9. Group photo (from left to right) Mr. Yuta Kitano, Ms. Hongjuan He, Mr. Mizuho Yokoyama, Mr. Koji Hamada