AT WORK

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Abe Kensetsu Co., Ltd.

Taking Full Advantage of ICT-Integrated Construction Machinery!

3D-MC^2 and 3Dxi Triumph Over Labor Shortages, Deliver Competitive Edge

Abe Kensetsu Co., Ltd. is a general contractor that primarily works on projects in the city of Sakata, Yamagata, where it is based. "We have done a lot of road construction recently," Abe Kensetsu Representative Director Masashi Abe said. "However, we do general residential and other types of construction work as well."

Masashi Abe, Representative Director

The company has a unique policy of seeing the entire construction process through from start to finish, only subcontracting the rarest of rare types of work. Thus, Abe Kensetsu owns a diverse lineup of the latest machinery and equipment, from multiple MDTS and imaging total station IS to HiPerV GNSS receivers, data collectors, design software, and machine-control and machine-guidance systems. The company is also proactive about employee education, and has amassed a multi-skilled workforce by training all employees in control point surveying as well as three-dimensional data designing, heavy machinery operation, completed work inspection and electronic delivery.

We visited Abe Kensetsu at the site of their road improvement project, where they were doing excavation and slope shaping for road embankment and pour-in-place structural work using the machine-control system 3D-MC GNSS Dozer Z63 3D-MC^2 (3D-MC^2) and the machine-guidance system 3D-MG GNSS Shovel 3Dxi (3Dxi).

Solving Labor Shortages, Increasing Competitiveness

According to Abe, the foremost problem that Abe Kensetsu faces is a shortage of labor. The lack of young engineers and operators is of particular concern throughout the construction industry. Another major challenge is winning bids. If a multitude of competitors in the industry does the same things, tenders become nothing more than competitions on price. Add to that increasingly difficult demands from clients in terms of both schedules and expenses, and it is plain to see that a company's survival depends on them improving their technology and productivity, and solidifying their business foundation to retain their profits. In that spirit, Abe Kensetsu first set its sights on gaining the ability to survey completed work through total stations, and then on introducing the 3D-MC^2 and 3Dxi. "I thought adopting machine-control and machine-guidance systems would help us solve our problems," Abe said. "We tried the 3D-MC^2 first. The system required a sizeable investment, so we started by renting. After we saw how easy the system was to use, and how it did such beautifully finished work, we knew we could use it, and decided to make the investment."

The User-Friendly 3D-MC^2

Abe Kensetsu won bids with technical proposals that included the use of the 3D-MC^2. The company also presented a report on work done with the 3D-MC^2 to a construction technology commission at the Sakata River Construction Office in the Tohoku Regional Bureau of the Ministry of Land, Infrastructure, Transport and Tourism; the presentation earned the top prize in the technology category. This award added one point to the company's evaluation scores throughout the year. Clearly,

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introducing 3D-MC^2 helped Abe Kensetsu resolve its problems.

Kazuya Ikeda, Construction Supervisor

Abe Kensetsu Construction Supervisor Kazuya Ikeda spoke to the advantages of using the 3D-MC^2 in the field.

"The biggest advantage is that anyone who can operate a bulldozer can use this system to perform the work according to the design data," Ikeda said.

"Actually, we allowed a new employee who had just earned their operator's license to use the system, and they did the job beautifully. The system also has a high-speed mode that enables us to finish our work at least twice as fast."

The system's effectiveness during winter is particularly intriguing. "When a site is covered in snow, we have to remove it before starting construction work," Ikeda said. "But with the 3D-MC^2, snow removal is easy and quick, and it can remove the snow without disturbing the ground, too! That feature is probably not as useful in urban areas, but it's yet another advantage here in the countryside."

3Dxi: No Finishing Stakes, Improved Safety

Switching gears, Ikeda talked about the advantages of introducing the 3Dxi and how using it has changed things in the field. "The biggest difference was that we did not have to install finishing stakes because we used three-dimensional data to do the work," Ikeda said. "That alone increased efficiency dramatically. It was also helpful to be able to see differences between reality and design figures in real time as we worked.

For curves and other difficult shapes, we used to depend on our experience and gut feelings to install finishing stakes at the midpoints. Now, we simply follow the guide, and that allows us to do precise work without cutting too much or missing cuts anywhere."

Ikeda continued on the topic of safety, which improved even more under the new system. "We used data to create and execute road alignments as well as structural alignments and subgrades. Roadbed excavation used to require us to set up a water system and stand next to the shovel to direct the bucket up and down. With the 3Dxi, we no longer need to do that or be concerned about collisions."

Embodying the i-Construction Program

Abe Kensetsu is already well acquainted with machine-control and machine-guidance systems. The company plans to use the 3D-MC^2 for housing land development, farmland improvement and other work that does not yet capitalize on the possibilities of information technology. Abe Kensetsu also aspires to expand business. "We started using three-dimensional data ahead of our competitors," Abe said. "Now, we can do everything from design data creation to electronic delivery in-house. It would be great if we could develop this knowledge and experience into consulting business in the near future."

"Our next challenge is to make use of three-dimensional point group data," Abe added. The company earned an ICT-integrated construction project from the Tohoku Regional Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, and is currently working on aerial surveying using drones. Abe Kensetsu is definitely a company to watch as it continues to advance toward the ideals of the i-Construction ICT-integrated construction program.

Abe Kensetsu's acute awareness is evident in its full use of three-dimensional data in construction, surveying and inspections; and in its dedication to training all employees in the technology.

*** "i-Construction" is...**

Ministry of Land, Infrastructure, Transport and Tourism (MLIT) in Japan has been promoting "i-Construction", that the Japanese construction companies shall utilize 3D data in all the procedure of construction work to increase its productivity dramatically, generated by not only the conventional equipment such as Total Stations and GNSS receivers but also Drones, 3D Laser Scanners, and ICT Construction Machineries. "i-Construction" is a registered trademark of the National Institute for Land and Infrastructure Management, MLIT.