

## Expanding Work Categories Applying Completed Work Dimensional Control Using TS

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### 1. Introduction

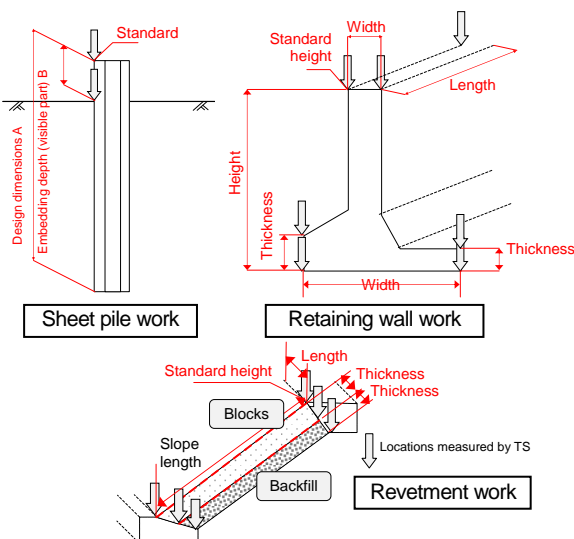
One program in the Second Stage Information Integrated Construction Promotion Strategy established by the Ministry of Land, Infrastructure, Transport and Tourism is the expansion of work categories performed applying "completed work dimensional control using a Total Station (TS)". The following introduces efforts to expand completed work dimensional control using TS, which is already applied to earthwork and paving work, to include peripheral works, and to develop measurement methods that will achieve overall labor saving.

### 2. Targeted peripheral works

The work categories where we intend to apply TS to completed work dimensional control are 1) revetment work (placing and pitching concrete) and 2) earth retaining work (sheet pile work) and 3) retaining wall work (cast-in-place and precast). These were selected considering frequency of use and ability to divert earthwork measurement work to other purposes. Figure 1 shows the relationship between dimensional control standards for these works with the measurement locations when using TS.

The Euclidean distance (length of width etc.) between two end points is calculated according to the coordinates

Figure 1 Dimensional Control Standards and TS Measurement Locations

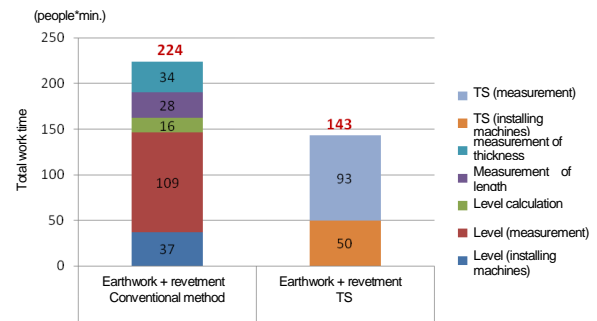


obtained by TS.

### 3. Verification of time reduction effects

Figure 2 shows an example (concrete pitching) of the results of comparing total work time required to perform an on-site trial of TS completed work control on new work categories and measure the completed work for a case doing everything using conventional methods and a case applying TS completely to completed work control. In this way, time reduction effects were shown for revetment work and earth retaining work. It reveals that in the case of revetment work, although it took a little longer to install the machinery than when using the conventional method, later measurement work was performed much more efficiently.

Figure 2 Example of time reduction effects



On the other hand, the time reduction effects were limited in the case of retaining wall work. One reason considered is that completed work dimensional control of a concrete structure is work often done by installing scaffolding, and it is difficult to ensure visibility of the prism.

### 4. In Conclusion

Our Division is undertaking a variety of measures to contribute to reducing labor requirements at construction sites using ICT. In the future, we will try to gradually apply the method by clarifying the feasibility through field trials.

[Sources]

- 1) Proceedings of the Twenty-sixth Construction Machinery and Construction Symposium (p33-36)
- 2) Second Information Integrated Construction Promotion Strategy (Ministry of Land, Infrastructure, Transport and Tourism)

<http://www.mlit.go.jp/common/000993270.pdf>