Support for introduction of various bidding and contracting methods



The Public Accounting Act in Japan takes the principle of public bidding and the lowest price. On the other hand, it allows the application of limited tender contracts and competitive bidding. From the viewpoint of quality assurance etc., competitive bidding had been widely applied to public works in Japan. However, since around late 1980s, there had been a growing demand for transparency, fairness, and competition in public construction bidding triggered by the Japan-U.S. Construction Initiatives and other demands for opening the market, as well as bid rigging cases. As a result, there was a shift from nominated competitive bidding to general competitive bidding/overall greatest value method is currently applied to most of the construction projects conducted directly under the MLIT. In addition, the 2014 revision of the Act on Promoting Quality Assurance in Public Works (hereinafter referred to as the "Quality Assurance Act") has led to the application of the various bidding and contracting methods, such as the technical proposal and negotiation method, project promotion PPP, limited tender contracting and competitive bidding for disaster recovery work, and the framework method, depending on the nature of the work and local situations.

In introducing a new bidding and contracting method, it is necessary to adapt to different methods for the implementation flow, technical evaluation, setting of requirements, risk sharing, hearing opinions from academics, and publication of results. As a result, the burden on both the client and the contractor tends to be high at the beginning of the introduction. In introducing the general evaluation bidding method, the technical proposal and negotiation method, project promotion PPP, limited tender contracting and competitive bidding in times of disaster, the framework method, etc., the NILIM, in cooperation with the MLIT and the regional development bureaus etc. is implementing a cycle of planning implementation methods by providing support for their application in the field, following up on their application, making improvements through feedback of findings, and promptly reflecting the findings in subsequent cases and various guidelines. The NILIM is also conducting ongoing analyses of bidding and contracting data, surveys of the latest trends in bidding and contracting in Japan and abroad, risk analysis of public works projects, and other research and studies to help improve bidding and contracting methods.

2. Main Research Results

1) Overall greatest value method

The first application of the overall greatest value method in bidding in Japan was the Imai No. 1 Bridge Removal Project, publicly announced by the Kanto Regional Construction Bureau in November 1998. In the early years of its introduction, the overall greatest value method was adopted mainly for large-scale, technically challenging construction projects. And the evaluation method was based on the value for money (VFM) concept, whereby the improvement in construction quality was converted into a monetary value. On the other hand, evaluation based on VFM was a significant burden on the contractor, which was a challenge for the spread of the overall greatest value method.

In response to this, the June 2002 notice, Methods of Evaluating Performance etc. in the Overall Greatest Value Method for Bidding on Construction Work was issued. This has changed the application of strict VFM to a VFM-based evaluation. In addition, with the enactment of the Quality Assurance Act in March 2005, many public works projects became eligible for either the simplified, standard, or advanced technical proposal type of the overall greatest value method, depending on the nature and scale of the work. These led to the expansion of the application of the comprehensive evaluation bidding system (Figure 1). With the subsequent expansion of the application of the overall greatest value method, such problems as the excessively low-priced bidding of construction prices, over-specification of

technical proposals, and procedural burdens on the contractor became apparent. As a measure to prevent the excessively low-priced bidding, in November 2006, a trial introduction of a construction system verification type overall greatest value method was introduced. In this method, technical evaluation points are awarded according to the readiness of construction system. In addition, a compilation of over-specification case studies was created as a countermeasure against over-specification. Improvement



Figure 1 Trend in the number of biddings to which the overall greatest value method is applied

plans were proposed to reduce the burden on the client and contractor, such as the polarization into two types—the construction capability evaluation type and the technical proposal evaluation type—as well as a call for technical proposals that focus on ensuring quality. These were reflected in the March 2013 *Guidelines for the Operation of the Overall Greatest Value Method for Construction Projects* conducted directly under the MLIT.

In order to improve operations, the NILIM is continuously analyzing bidding and contracting data, conducting questionnaires and hearings with clients of contractors etc. to identify issues and consider measures to address them.

The technical proposal evaluation type (Type A) requires proposals that involve changes to the target, and basically accepts orders that cover both design and construction. This can reflect the advanced technologies of the contractor to the design. Meanwhile, it is not applicable to construction projects with risks beyond the contractor's control, such as consultations with related agencies. For this reason, the number of applicable construction projects is limited.

The technical proposal evaluation type (Type S) requires proposals that ensure the quality of construction work etc., while proposals involving changes in the target or consultation are not applicable. Therefore, its problem is that elemental technology proposals tend to be the main focus, and it is difficult to differentiate bidding based on scores in technical evaluations (Figure 2).

The construction ability evaluation type is often applied to smalland medium-scale construction projects where there is little room for technical ingenuity. On the other hand, the bidding is conducted on a project-by-project basis, and the issue is to simplify procedures, such as the confirmation review process. In maintenance and repair project, bidding irregularities and one-party bids are more likely to occur. Securing a system to support regional infrastructure has become a challenge (Figures 3 and 4).

In light of these issues with the overall greatest value method, a survey was conducted on the technical proposal and negotiation method to be applied to construction projects for which specifications and preconditions cannot be determined, the framework method to help secure a system to support regional infrastructure, and other methods. In response to the technical evaluation of the general evaluation bidding method in which it has become difficult to differentiate bidders based on scores, an improved method of technical evaluation was proposed to standardize highly effective and frequent proposals and to enable a variety of proposals that contribute to productivity improvement in low-risk construction projects.

The revision of the Quality Assurance Act in June 2014 indicated that a variety of bidding and contracting methods should be selected according to the nature of the construction work and local conditions.







Figure 3 Number of participants in the competitive bidding for general civil engineering work



Figure 4 Number of participants in the bidding for maintenance



Technical cooperation/construction type Figure 5 Flow of technical proposal and negotiation methods



Photo: Support for on-site application of technical proposal and negotiation methods

As a result, the various bidding and contracting methods shown in 2) through 5) below are now being applied and are not limited to the general competitive bidding and general evaluation bidding methods. To support the introduction of these various bidding and contracting methods, a list of ideas, points to keep in mind, and examples of implementation for each method were compiled. This was then reflected in the guidelines for the application of bidding and contracting methods for public works, which were created in May 2015.

2) Technical proposal and negotiation method

The technical proposal and negotiation method was stipulated by the revision of the Quality Assurance Act in 2014. This method allows the contractor to be involved from the design stage in construction projects where specifications are difficult to determine and allows the contractor's advanced skills and ingenuity to avoid rework to be reflected in the design (Figure 5). The technical proposal and negotiation method in construction projects conducted directly under the



Figure 6 Effect of the application of technical proposal and negotiation method

MLIT has not been applied to actual construction projects. Under such circumstances, in June 2015, the operational guidelines were formulated to incorporate the process of technical cooperation and price negotiation by constructors into the conventional procedures of the overall greatest value method and technical proposal evaluation method. The NILIM analyzed issues that arose in the course of procedures for the Yodogawa Bridge slab replacement work, the Futaenotoge Tunnel work, and the Saikawa Bridge repair work to which the said method was applied for the first time in FY 2016. It then proposed a technical evaluation method as a technical proposal and negotiation method different from the overall greatest value method, the implementation period of design and technical cooperation, risk sharing, and a method to confirm the appropriateness of construction costs. These were reflected in the revised guidelines in December 2017.

This revision ensured that additional studies and consultations were to be conducted as necessary and that sufficient time was to be provided for design and technical cooperation to be carried out. As a result, the period between the public notice and the conclusion of the construction contract lengthened, and the burden on the client, designer, and contractor increased. In response, the NILIM analyzed causes of the burdens in design and technical cooperation in the technical proposal and negotiation method. The results were reflected in the guidelines revised in January 2020. These guidelines clarified how to set flexible procedural periods according to the characteristics of the construction work, procedures for implementing design work and technical cooperation work, and the division of roles among the client, designer, and contractor. Since then, the NILIM has continued to analyze the effectiveness of the application of the technical proposal and negotiation method in construction projects where the method has been applied, as well as the issues involved. The NILIM is also conducting research to further improve and expand the application of technical proposals and negotiation methods (Figure 6).

3) Project promotion PPP

With the background of the globalization of the construction market, interest in the CM method, which began in the United States in the 1960s, has increased in Japan. The Chubu Regional Development Bureau introduced the client-supported CM in March 2001, including the Kiyosu JCT Upper and Lower Section Construction Work. The CM method, which is often applied to overseas projects, is often introduced by client organizations that have no or significantly few technical staff. Therefore, the implementation method etc., which corresponded to the project implementation system of the MLIT and which has a considerable number of technical staff, had become an issue.

After the Great East Japan Earthquake in March 2011, the Tohoku Regional Development Bureau introduced Project Promotion PPP for

reconstruction road projects, such as the restoration of the Sanriku Coastal Highway. The project promotion PPP is characterized by the integration of a team of private-sector engineers consisting of experts in project management, survey and design, land use, and construction, and an office team (the client), as well as by efficient management while integrating the information, knowledge, and experience of both the public and private sectors. It thereby aims to promote construction projects. The NILIM has been following up on the implementation of project promotion PPP in Tohoku and has reported on the effects and challenges of introducing the project promotion PPP.



Figure 7 Detail of the project promotion PPP

After its introduction for reconstruction roads in Tohoku, the project promotion PPP has been widely applied to restoration and reconstruction projects after the Kumamoto Earthquake in April 2016, as well as to large-scale projects in normal times. In order for the Ministry of Land, Infrastructure and Transport (MLIT) to promptly introduce the project promotion PPP when needed, the NILIM studied the implementation status and challenges of introducing the project promotion PPP in various regions. As a result of the study, a standard implementation method for the project promotion PPP was compiled (Figure 7) and reflected in the March 2019 guidelines for using the project promotion PPP in projects conducted directly under the MLIT. In addition, even after the guidelines were prepared, securing and fostering the leaders of the project promotion PPP remained an issue to be addressed. The NILIM has thus compiled a list of measures to improve incentives for receiving orders, such as easing restrictions on the number of orders allowed within a construction zone, based on trials at regional development bureaus etc. and reflected them in the revised guidelines in March 2021.

Normal time

4) Limited tender contracts etc. for disaster recovery

Under the basic principle of applying the general competition method and the overall greatest value method in bidding system, the issue was to clarify the concept of carrying out bidding and contracting in times of disaster so that limited tender contracting and competitive bidding can be appropriately carried out when necessary for speedy disaster restoration and reconstruction. The NILIM has compiled a timeline of the

application of bidding and contracting methods in recent largescale disasters, including the Great East Japan Earthquake (March 2011), the Kii Peninsula Flood (September 2011), the landslide disaster in Hiroshima caused by heavy rain (August 2014), the flood in Kinugawa (September 2015), and the Kumamoto Earthquakes (April 2016). Then, the NILIM proposed the concept of applying the bidding and contracting method according to the restoration stage and reflected it in the guidelines for the application of the bidding and contracting method in disaster restoration formulated in July, 2017.

After the revision of the Quality Assurance Act in June 2019, the urgent situations and scenes in times of disaster were

Notes
Public value of experiment
Public value of expe

Emergency restora





Full recovery

Figure 9 The concept of performing bidding and contracting in disaster recovery

organized in a timeline in order to enhance emergency response to disasters and to ensure the quality of surveys and designs. Even during the restoration stage after temporary levees are constructed, even the slightest rainfall can cause significant disruption to residents' lives, such as requiring evacuation. For such cases, the NILIM proposed the idea of allowing the application of a limited tender contract for a period of time until the target recovers the functions and performance it should have. These were reflected in the operational guidelines of the Quality Assurance Act (March 2020) (Figures 8 and 9).

5) Framework method

With the expansion of the application of the general competitive bidding and overall greatest value method in the bidding system, bidding irregularities and single-party bids are more likely to occur in maintenance and repair work. Thus, securing a system to support local infrastructure has become an issue. The framework method is a method in which individual construction projects are ordered from a group of companies (framework companies) selected through public solicitation. The NILIM has studied the applicability of the framework method (Figure 10) in Japan by investigating its implementation overseas, the status of implementation of construction projects that tend to have fewer



Figure 10 Outline of the framework method

competitive participants, and other issues. The Kanto Regional Development Bureau introduced the framework method on a trial basis for the restoration work after the East Japan typhoon of 2019. Later, the application was then extended to the Kyushu Regional Development Bureau's Kuma River disaster restoration and the Kanto Regional Development Bureau's regular construction work etc. Currently, the

NILIM is studying implementation methods for maintenance work in cooperation with regional development bureaus that are willing to introduce the system to maintenance work.

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4. Future Outlook

In promoting DX in the infrastructure sector and improving construction productivity, it is important to strengthen collaboration among project processes and stakeholders, and to facilitate the smooth integration of information, knowledge, and experience among project stakeholders. The NILIM will support the application of various bidding and contracting methods and follow up on the status of their application. By doing so, we plan to continue our research that will contribute to the establishment of a construction and production management system that is balanced with perspectives of cooperation, continuity, and efficiency, while paying sufficient attention to ensuring transparency, fairness, and competitiveness.