

A Study on Measures for Sharing Excellent Design Drawings and Documents

HyunOk*, Jin-UkKim**, Sung-Hoon Yang***

Korea Institute of Construction Technology, Republic of Korea

E-mail : okhyun@kict.re.kr*, jukim@kict.re.kr**, ispector@kict.re.kr***

1. Introduction

In recent years, the Construction industry has significantly grown in volume, thanks to increased overseas orders, but with such growth focused on the construction execution area, the high-value-added area of Construction Engineering(Below, CE) has a very low share and low competitiveness in overseas markets. Furthermore, the construction order volume and technical competitiveness are becoming deeply polarized between large and small CE companies. Notably, the existing CE-related information systems mostly focus on simply accumulating data such as designs and specifications, and providing the corresponding information, but do not properly provide the information truly required by the CE industry.

This study sought to prepare a system of sharing information on excellent design documents in construction areas (roads, rivers, railroads, and ports) required by the CE industry, so as to assist in enhancing the technological power in the CE area. Towards this end, excellent design documents by construction area were selected, and a system construction measure was presented to enable the sharing of information on design documents between ordering agencies and CE companies. This measure will be used in executing similar construction projects, and will provide the information speedily, thereby shortening the work handling time and boosting work efficiency.

2. Main Subject

2.1. Overview of Design Documents and Analysis of Work

In this study, a wide range of opinions were gathered from ordering agencies and CE companies, and the relevant work was analyzed through surveys of necessary CE information, the review of measures for the connection of the sharing of information with KISTEC, meetings with relevant institutes for sharing of excellent design documents, and gathering of opinions on the sharing of excellent design documents from CE companies.

First, construction experts in the industry, academia, and government agencies were surveyed using survey methods such as online and e-mail surveys. Four questions were asked concerning the necessity of sharing design documents, the design document outputs that need to be shared, information on the design documents required by the CE industry, and search items for the sharing of design documents. First, 90% approved the necessity of sharing design documents, and the design document outputs that need to be shared were found to be design drawings and design reports. Also, the information on design documents required by the CE industry was found to consist of design documents, which earned high scores in the evaluation by ordering agencies; design consultation and review data; and design documents that contain consultations with the relevant agencies. Lastly, the search items for the sharing of design documents were found to be the project(construction) name and construction area (project type).

Second, the surveys revealed that KISTEC manages construction completion documents only on first- and second-class facilities, which are used in inspection and diagnosis work. For the sharing of information on design documents in connection with KISTEC, the scope of sharing should be defined, and consultation with MOLIT was required. Third, in the meetings with the relevant agencies, it was discussed with the staffers in charge of the design services at 11 ordering agencies under the control of MLOIT to review if it was possible to disclose design documents owned by ordering agencies as well as to discuss measures for gathering electronic files for the online sharing thereof. Fourth, to gather opinions from CE companies, ten staffers from seven CE companies were interviewed on three occasions. They responded that design document outputs, which are currently supplied to ordering agencies, are somewhat excessive in terms of volume and contain many unnecessary contents, and that incentives should be given to the sharing of design documents. Also, rather than sharing the information on many design documents, one or two documents by ordering agency are needed a year, and all the design documents should be able to be searched and inquired about on the search screen.

2.2. Selection and Gathering of Excellent Design Documents by Construction Area

The surveys revealed that the design documents managed by ordering agencies should not be totally shared; instead, excellent design documents by construction area should be selected and shared. It was difficult to define the criteria and guidelines for excellent design documents, however, so through meetings among the relevant agencies, the criteria for design documents were defined. Design documents, evaluated as excellent by ordering agencies, were determined as excellent documents, and design services performed by excellent CE firms designated by ordering agencies were determined as the target of excellent design documents. The scope of design outputs for the sharing of design documents were defined as design drawings and design reports.

The ordering agencies that share excellent design documents totaled 12 affiliated and subordinated agencies, namely four local national land management offices, four regional maritime port agencies, and four subordinated

agencies, and the number of design documents to be gathered totaled 65. By ordering agency, 33 design documents came from affiliated agencies, and 32 from subordinated agencies. By construction area, there were five construction areas: road, river, port, railroad, and others. Thirty design documents came from the road area, 10 from the river area, 5 from the port area, 17 from the railroad area, and 3 from others.

2.3. Preparation of a System for Sharing Design Documents by Construction Area

In this study, “Section of Sharing Excellent Design Documents” was constructed in the CALS portal system, one of MOLIT’s construction project information systems, to share the information on excellent design documents required by the CE industry between ordering agencies and CE companies.

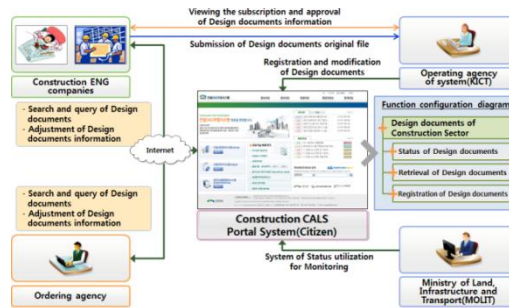


Figure 1. Concept Diagram of System

The database for the Section of Sharing Excellent Design Documents was designed to consist of four tables, namely “tree information on excellent design documents”intended to access and manage the information in the tree structure of excellent design documents, “project information on excellent design documents” intended to manage the entire information on design drawings and design reports, “index information on excellent design documents reports”and “excellent design documents involving facility information”intended to separately manage facility information.

The Section for Sharing Excellent Design Documents was made to be located on the initial screen of the Construction CALS portal system, targeting ordering agencies and CE companies as users. To access the information on excellent design documents, the system was designed to enable only authorized members and users to use the system. Also, the information on design documents to be shared was limited to design drawings and design reports among design documents, and design documents were required to be registered in PDF files so as to prevent the editing of design documents when accessing them.

The major functions of the Section for Sharing Excellent Design Documents were composed of an overview of excellent design documents, search for excellent design documents, registration of excellent design documents, and revision of excellent design documents. The function of the overview of excellent design documents was designed to gather and show the overview of the disclosed information on design documents by ordering agency or construction area, and to inquire about details when selecting statistics. The function of search for excellent design documents was designed to inquire about individual construction areas (business types) such as overview, road, river, and port, and to inquire about details on design documents via Viewer. The function of registration of excellent design documents was designed to register the project information, the design reports, the index information, and original files of design documents.

3. Conclusion

In this paper, measures for constructing a system designed to access and use excellent design documents in projects –which MOLIT’s affiliated and subordinated ordering agencies select according to various construction areas, such as road, railroad, and port –with other ordering agencies and CE companies were presented. The proposed system is expected to use excellent documents as references in reviewing technologies, selecting routes, and consulting with the relevant agencies when carrying out similar projects as well as handling petitions. The system will speedily provide information on similar cases, shortening the work handling time and boosting work efficiency. Also, through the sharing of the information on excellent design documents, the technical competitiveness in the CE category will be enhanced, and the capabilities in design, CE, and other high-value-added areas will be bolstered.

4. References

- [1] [Ministry of Land, Infrastructure and Transport, “12 Operations and Technical Improvement of Construction CALS System (II)”, Korea Institute of Construction Technology, Korea, December 2012.
- [2] Ministry of Land, Infrastructure and Transport, “13 Operations and Technical Improvement of Construction CALS System (II)”, Korea Institute of Construction Technology, Korea, December 2013.
- [3] <http://www.calspia.go.kr>
- [4] <http://www.kistec.or.kr>