

Research on the Advancement Planning of an Information System for Design Deliberation

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Abstract. Public order agencies, including the Ministry of Land, Infrastructure, and Transport (MOLIT), have conducted design deliberation and evaluation in accordance with the relevant laws and regulations to carry out large-scale public construction projects, including design-build and alternative-design contracts as well as technical proposals, such as bidding. The design deliberation data are managed separately, however, which has caused much trouble in the verification of the data and in the operation and management of the design deliberation system. This study was conducted to present advancement planning for the design deliberation information system through the computerization of data and the standardization of the existing design deliberation process. Through this study, the efficient management and utilization of design deliberation information becomes possible through the use of the online sharing design deliberation information between the deliberation officials, for improving the transparency of design deliberation work.

Keywords: Design deliberation information, Advancement planning, design-build (turnkey), alternative-design contracts, technical proposal tendering

1 Introduction

Public ordering agencies, including the Ministry of Land, Infrastructure, and Transport (MOLIT), have been performing design deliberation works pursuant to the laws and regulations governing the processes of large public construction projects. However, no systematic management has been performed on the design deliberation information system ever since the establishment of the design deliberation system. Furthermore, construction officials have been dogged by numerous difficulties in tracking down necessary information and in operating and maintaining the design deliberation system, as various data related with the design deliberation process have been managed by respective ordering agency or by deliberation institution.

This study suggests an advancement planning design information system that can manage integrated design management information. By doing so, it would be possible to manage and utilize the design deliberation information efficiently in public construction projects. Online sharing of deliberation information among design deliberation officials would ensure transparency in the design deliberation process.

2 Main Subject

2.1 Status Analysis of the Design Deliberation System

Design-build is an ordering system that applies to over-KRW30-billion large-scale construction projects. It is a method of delivering a project in which the design and construction services are contracted by a single contractor. The winning contractor is determined through the overall consideration of the design and bidding prices. The competition in design among the bidders secures the quality of the design. Alternative-design contracts are an ordering system in which the working design types, which are made by an ordering agency, can be replaced by the design types of the bidders that have the same or a higher level of functions and effects with lower costs reflecting new construction methods, a new technology, or a reduced construction duration. While design-build and alternative-design contracts have many advantages, including technology competition, better construction quality, and less design modifications, they also have problems, such as lobbying related to design deliberation and the lack of evaluation professionalism [1].

Technical proposal tendering is an ordering system in which the bidders prepare and submit technology proposals along with bidding proposals based on the basic design, working design, and bidding guide of an ordering agency [2].

2.2 Design Deliberation Tasks and Requirement Analysis

The design deliberation tasks involve the deliberation institutions, the ordering agencies (the institutions requesting for deliberation), the deliberators, and the bidders. The deliberation institutions consist of 27 ordering institutions, including MOLIT, 4 government departments, 16 municipalities, and 7 public corporations. They select the deliberators, establish the deliberation plans according to the deliberation requests from the ordering agencies, announce the evaluation results, clarify the complaints, and manage the deliberation results. Also, they perform site surveys according to the deliberation requests and hold deliberation plan presentations and technology review meetings. The ordering agencies request for deliberation from the deliberation institutions and prepare such data as the bidding guides and design reviews. The bidders submit the data on their respective bidding suggestions. Finally, the design deliberators consist of 100 deliberators from the design deliberation section of the central construction technology deliberation committee of MOLIT [3].

2.3 Advancement Planning of Design Deliberation Information System

A design deliberation information DB was designed in this study for the systematic management and utilization of design deliberation information. The design deliberation information DB consists of three major tables: the “deliberation issue detail” table, which manages the design deliberation issues; the “bidding participants” table, which manages the design deliberation bidders; and the “deliberation results of each deliberator” table, which manages the deliberation results [4].

The design deliberation information system proposed in this study is a MOLIT work system, and it is intended to be operated inside the CPIPS (Construction Project Information Portal System), one of the CPIS (Construction Project Information Systems) used by the MOLIT headquarters and subagencies. The CPIPS is a gateway to the CPIS. It works as a single-access window and performs public services by integrating the information from each construction project information unit system and their operating environments. The system enables the sharing of diverse construction information. The figure below is a concept diagram of the said CPIPS [5].

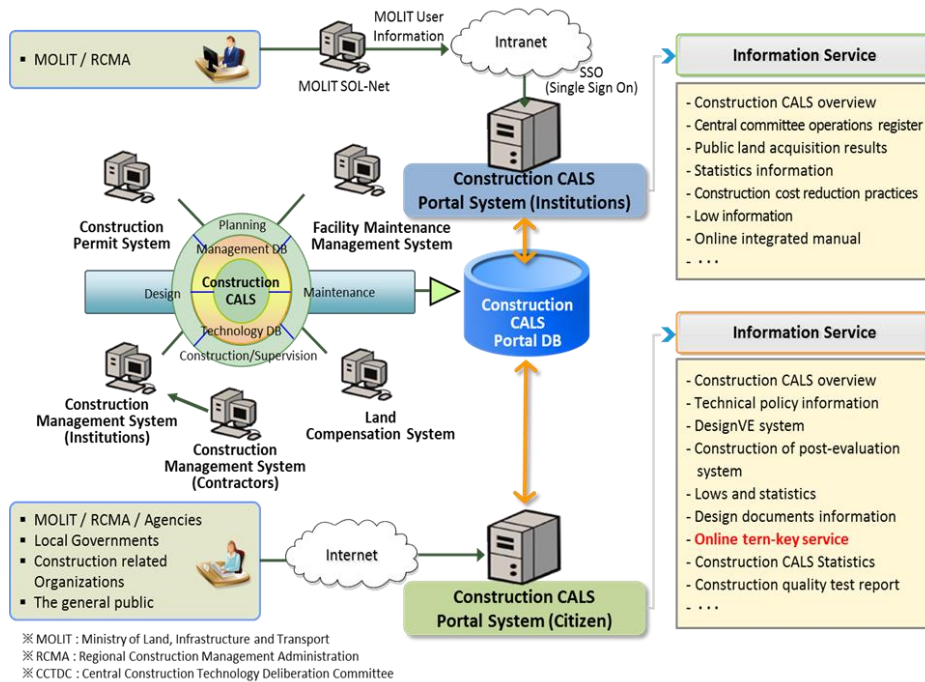


Fig. 1. Concept diagram of the CPIPS

The CPIPS consists of the agency portal system, which is used by the MOLIT headquarters and subagencies, such as five regional construction and management administrations, and the public portal system, which is used by the MOLIT subagencies, other departments, municipalities, construction companies, and the general public. The agency portal system has 10 major functions, including the operation of the central committee, and the public portal system has 10 major functions, including the post-evaluation of construction projects, design VE square, online turnkey square, design drawing information square, and cost reduction cases of construction projects. The design deliberation information system was constructed for further deliberation activities, such as data review for design deliberation, questions and answers, and corruption reports. The system aims at the efficient operation of the

design deliberation system and the systematic management of the deliberation data for technology bidding projects, such as turnkey.

The design deliberation information system was initially constructed by reflecting the latest information technologies, such as the framework, but it created many problems in terms of system maintenance and user convenience. To address these problems, this study applied the e-government standard framework in the system, eliminated the unnecessary Active-X, and adopted the Web standard for accessing the Web and ensuring compatibility between systems, thereby advancing the system. The following figure is the concept diagram of the system [6][7].

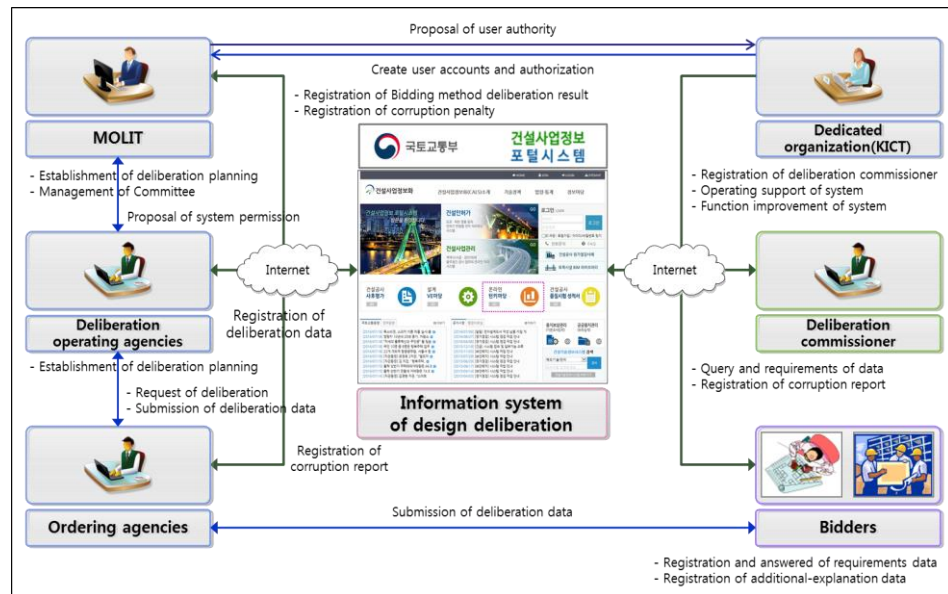


Fig. 2. Concept diagram of the information system

The design deliberation information system is located in the middle of the initial screen of the CPIPS. The system has four major functions for the systematic management of design deliberation information: committee management, bidding method deliberation management, design deliberation management, and corruption report management [6][7]. The figure below shows the configuration functions for design deliberation management.

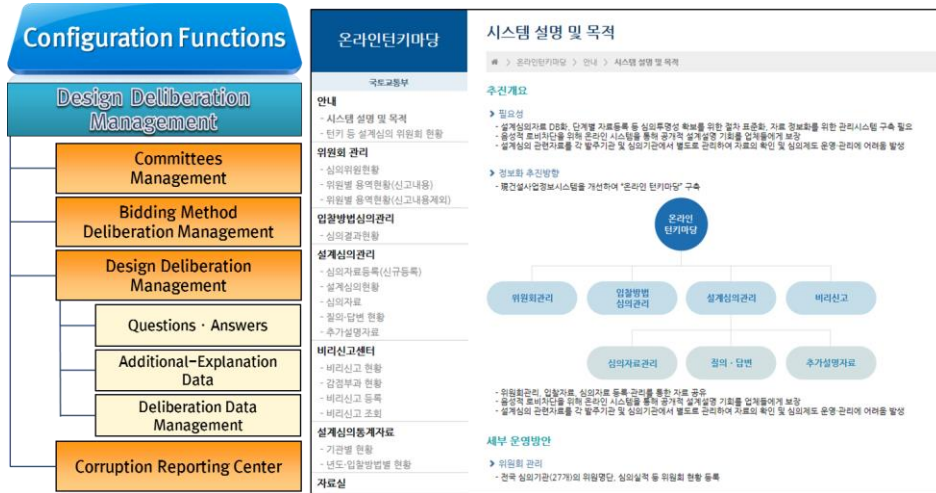


Fig. 3. Configuration functions of design deliberation information system

In committee management, the committee status is managed, including the list of deliberators and their deliberation records. The deliberators designated for each design deliberation case can be referred to in committee management. In bidding method deliberation management, the bidding method deliberation results are managed, and those results can be referred to and new ones can be registered. In design deliberation management, the deliberation data, design deliberation status, question-and-answer status, and additional-explanation data are managed by design deliberation case. The following figures show design deliberation status and design deliberation data.

심의기관	심의요청일	심의완료일	심의요청기관	진행상태
1. 전라남도 교통건설국	2016/04/27	2016/06/10	전라남도 교통건설국	심의완료
2. 제주특별자치도제주개발경제진흥원(제개발사업)	2016/03/24	2016/05/17	제주특별자치도 제주개발경제진흥원	심의완료
3. 한국수자원공사 수도권(파)지역상수도 물수급관리사업	2016/04/15	2016/05/10	한국수자원공사	심의완료
4. 조양동 기초과학연구원 본원1차 건설사업	2016/05/02	2016/05/02	미래창조과학부	심의완료
5. 한국표준과학연구원 본원1차 건설사업	2016/04/12	2016/04/12	한국표준과학연구원	심의완료
6. 한국표준과학연구원 본원1차 건설사업	2016/03/29	2016/03/29	한국표준과학연구원	심의완료
7. 강성남도 청원동 A-3B 공공주택사업	2016/02/22	2016/04/05	경남개발공사	심의완료
8. 국토교통부 총재청 3단계 복합과제 육조공(2공구)	2016/02/22	2016/04/09	총재청	심의완료
9. 국토교통부 총재청 3단계 복합과제 육조공(1공구)	2016/02/22	2016/04/09	총재청	심의완료
10. 국토교통부 서울 공로발행조치시각제공공단지 리모델링사업	2016/02/22	2016/03/26	한국자산관리공사	심의완료
11. 국토교통부 울산신항 개발 발파로안 육조공사	2016/01/29	2016/03/12	울산지방청	심의완료
12. 한국표준과학연구원 본원1차 건설사업	2016/01/06	2016/01/27	한국표준과학연구원	심의완료
13. 부산광역시 부산시영도 사상-리안신 3공구 기본설계 제작	2015/10/28	2015/12/11	부산공사	심의완료
14. 부산광역시 부산시영도 사상-리안신 3공구 기본설계 제작	2015/11/09	2015/12/07	부산공사	심의완료

대표사명	문서종류	첨부문서명	파일용량
1. 현대건설(주)	설계도서(제안서)	01-기본설계 요약보고서.pdf	41.81 MB
2. 현대건설(주)	설계도서(제안서)	02-기본설계 보고서.pdf	108.20 MB
3. 현대건설(주)	설계도서(제안서)	03-기본설계도면.pdf	101.92 MB
4. 현대건설(주)	설계도서(제안서)	04-구조 중 작용제안서.pdf	70.93 MB
5. 현대건설(주)	설계도서(제안서)	05-기반조사보고서.pdf	63.22 MB
6. 현대건설(주)	설계도서(제안서)	06-공사관리 계획서.pdf	59.12 MB

Fig. 4. Design deliberation status and design deliberation data

The figure below is the screen for design deliberation status registration. It manages information including the deliberation status, bidders, deliberators, project overview, deliberation data, deliberation results, and successful bidder. Finally, the corruption report center allows the input and reporting of corruption cases for improving the transparency in design deliberation. It consists of four functions: corruption report status search, penalty status search, corruption report registration, and corruption report search. The irregularity report center supports the input of the irregularity report and the notification of irregularity to ensure transparency in the design deliberation, and is composed of four key functions: irregularity report status; penalty point status; irregularity report register; and irregularity report inquiry. The following figure shows the irregularity report and the penalty points registry functions.



Fig. 5. Registration of corruption report and penalty imposed

3 Conclusion

The design deliberation and evaluation system for large-scale public construction projects was established by the related regulations and has been supplemented for continuous operation. The existing design deliberation information, however, has not been systematically managed, and the information has been separately managed by each ordering agency and deliberation institution, thereby making data verification impossible. Also, the consistent occurrence of corruption cases has lowered the transparency and reliability of the design deliberation system.

This study suggests an advancement planning design information system that can manage integrated design management information. The suggested system was found to improve the efficiency of the deliberation work through the systematic management and utilization of design deliberation information. In addition, the transparency of the deliberation work was enhanced by publicly providing design explanation opportunities to bidders online for blocking illegal lobbying during the

design deliberation, and by enabling the sharing of design deliberation information among the deliberators.

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