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Research paper

Enhancing the Selection Process in Architectural Services

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Abstract

Background/Objectives: Construction industry has a lot of influence on human life, so most countries have enacted law on construction and construction business is completed through various stages.

Methods/Statistical analysis: The stages contain 5 stages, which are pre-design, design, pre-construction, construction, and post-construction. And they can be divided into design and construction in the largest category. The architectural design field, which was the main field of the construction service industry in the construction industry, was searched by the law focusing on the designer selection method which had the greatest influence on the design stage.

Findings: The research team examined what kind of business was going on and tried to analyze what kind of problem is from a realistic point of view. In particular, the research team analyzed the design stage from a legal standpoint, searched Act on Contracts to which the State is a Party, Architecture Act, Framework Act on the Construction Industry, Construction Technology Promotion Act, Building Service Industry Promotion Act, and Certified Architects Act. As a results, problems with the design competition, problems with protection from design, problems of time in complicated processes were abstracted. Also, systems that conflict with the design industry's market arise, the company is limiting the opportunities for architectural design to advance. Therefore, this thesis presents ways to solve the problem by simplifying the design completion system, ensuring compliance with the design protection device, and complying with the appropriate design period.

Improvements/Applications: The research team tried to solve the problems in the field of construction design by simplifying design competition method, design protection device, and adhering to proper design period as an alternative.

Keywords: *Selection method, Building services, Industry promotion act, Architect firm, design competition*

1. Introduction

The construction industry has been ongoing since the existence of mankind, and it is also the industry that is responsible for the "house" that is the basis for human life. It has a lot of impact on human life as a single industry, so laws in the construction industry are enacted, maintained and managed in most countries. In Korea, many of the laws governing public construction projects are managed by a number of agencies such as Act on Contracts to which the State is a Party[1], Architecture Act[2], Framework Act on the Construction Industry[3], Construction Technology Promotion Act[4], Building Service Industry Promotion Act, Certified Architects Act[5] (Excluding electricity, telecommunications, fire fighting, and classified as other types of work are excluded from this study). The criteria to be considered in various laws are to be applied without any omission to long-term business procedures from basic design to maintenance. However, as in all laws, limitations and contradictions are revealed in realistic processes, so correction of these is very important.

In particular, there are a large number of stakeholders involved in the "design stage", which is the largest procedure of the construction business, namely the design and construction phase. In the construction service industry, there are 10,508 companies and the number of employees is 62,938 (2014 Architectural City Policy Information Center)[6] on this field in table 1.

Table 1: Comparison of Science and technology service and building service

		Science and Technology Service	Building service
No. of Company	2013	79,495	9,745
	2014	87,173	10,508
No. of Employee	2013	545,834	59,941
	2014	578,862	62,938
Sales(USD mil$)	2013	584.9	54.59
	2014	606.6	56.12

Therefore, this paper examines construction, one of the nation's key industries, the way in which the architectural design sector, in particular the key sector of the architectural service industry, has influenced, and how it has been assessed as a result of its selection.

2. Literature Review of Building Service

It includes In 1996, the nation legislated the "Framework Act on the Construction Industry" concerning research, design, construction, supervision, maintenance, and technical management of construction projects, and necessary matters concerning registration of construction businesses and contracts for construction projects. The Act provided that the government

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should ensure the proper construction of construction projects and sound development of the construction industry. In addition, the Construction Technology Management Act was enacted on December 11, 1987 to secure construction technologies by promoting R&D in construction technologies and managing them efficiently, and to contribute to the promotion of public welfare and the development of the national economy during the revision of Construction Technology Promotion Act (Act 17794) Construction technologies referred to in the Act include planning, investigation, design, construction supervision, safety inspection, maintenance, repair and procurement of facilities, and testing materials needed for construction, construction and testing work The Building Service Industry Promotion Act was enacted on June 4, 2013 to provide incentives and basic benefits for architectural engineers to secure a public service provider's business benefits and to secure a basic basis for their design. In addition, the architectural design method was selected by prioritizing the application of public projects (Article 21, Clause 2 of the Building Service Industry Promotion Act) to revive the construction service industry and improve the public architectural quality. Another important law concerning selection of architectural designers is very defined in Act on Contracts to which the State is a Party, and it is also defined in Article 79 of the Enforcement Decree of Act on Contracts to which the State is a Party, for which large construction projects and specific construction projects are to be decided. And, Architecture Act defines a construction method that determines the standard and use of land structures and facilities. The reason why this Act is important for architectural design is in Enforcement Decree, Appendix 1, and a below table 2 defines the types of buildings for each application.

Table 2: Types of Buildings

No.	Types of buildings	No.	Types of buildings
1	A single house	16	Amusement facilities
2	Apartment house	17	Factory
3	Type I neighborhood living facility	18	Warehouse
4	Type 2 neighborhood living facility	19	Dangerous material storage and handling facility
5	Culture and Assembly Facilities		Automotive facilities
6	Religious facilities	20	Animal and plant related facility
7	Sales facility	21	Resource circulation related facility
8	Transportation facilities	22	Calibration and military facilities
9	Medical facilities	23	Broadcasting and communication facilities
10	Educational research facility	24	Generating facility
11	Laid-off facility	25	Cementation-related facility
12	Training facility	26	A tourist lounge
13	Exercise equipment	27	Funeral home
14	Service facility	28	Campsite facilities
15	Accommodation	29	

The reasons why the above table is important are explained in the following section. Finally, the Architecture Act provided for matters concerning the qualifications and services of designers as provided under the Certified Architects Act, which was enacted in 1963 to enhance the quality of buildings. Under this Act, an architect defines the main acts of designing a building and supervising its construction. (A building that shall be licensed for construction according to Article 23 Clause 1 or that shall not be reported as a building under Article 14 Article 1 Clause 1 Article 66 or a building that is not to be re-designed in accordance with the Housing Act.)

3. A Study on the Decision Making Method of Architects

3.1 Architectural Design Implementation Process

Since public buildings are intended not for commercial or profitable use, they can be modified by examining basic plans, feasibility study or selection process of project plans. How to reach the stage where designers are to be prepared is defined by the Act, which examines:

Enforcement Decree of the Construction Technology Promotion Act

Article 67 (the process of execution of construction work) ① the Presidential decree, procedures and criteria (law article 46 paragraph 1) is construction procedures and criteria provided by the regulation of the implementation process. (less than "Construction of the execution process" is called.).

Building Service Industry Promotion Act

Article 23 (Preliminary review of public architectural projects) ① Public institutions must ensure that their buildings and structures achieve the public values, have the appropriate level of sophistication, and meet the reasonable standards.

If you plot the above information, it can be organized as shown in figure 1.

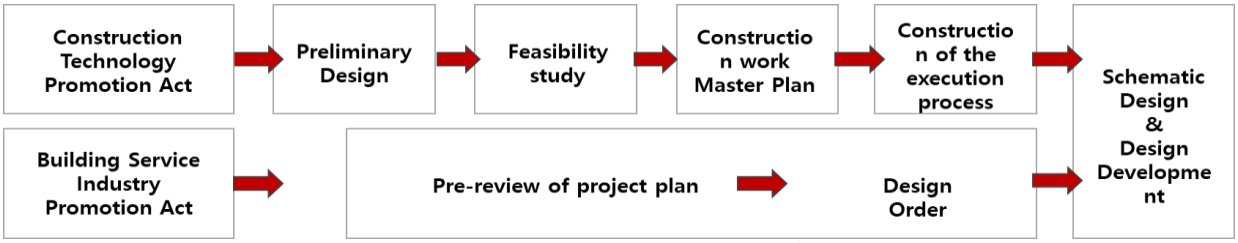


Figure 1:. Architectural Design Implementation Process followed by Act

Current law enables the owners to choose one of two methods, Construction Technology Promotion Act and the Building Service Industry Promotion Act, and therefore, whether or not to make a preliminary design or not to start a pre-review of project plan. But in reality, it is not clear which laws should be applied first, which makes it difficult for the client to apply them.

3.2. Analysis of Selecting Architectural Service

Important architectural laws were discussed in Chapter 2 and this chapter analyzed how designers were selected according to the above laws. If the construction project is equivalent to a collective

bid (Turn-key project) under Chapter 6 of the Enforcement Decree of Act on Contracts to which the State is a Party, the ordering office decides whether or not to apply for a collective bid or not and shall execute the project by collectively reviewing the application of the construction technical review committee. When the project is executed by collective bid as determined by the Commission, the consortium of the designer and the contractor submits a design or construction plan as an application for selection of qualified persons[7,8]. As construction control ability and technical ability of the contractor as well as design are concurrently evaluated, they are excluded from the scope of this thesis. Once the definition is made under Article 79 of Enforcement Decree of Act on Contracts to which the State is a Party, the construction technical review committee shall review the method of bidding for large projects. As a result, when the project is decided by the Committee on a collective bid, the project is made by a single tender with both the designer and the contractor selected as a team, so the designer is responsible for the design and construction participation. Therefore, the project to be determined by collective bid cannot be considered an architectural design field because it also evaluates the contractor's ability to do the same. Therefore, the collective bidding process is excluded from the subject of this paper. If the ordering office decides to execute the construction project as a separate design construction bid rather than as a collective bid, the "Design competition" is applied first. As a result, in case of a project rather than a collective bid, the design competition is applied first. The reasons for this can be found in Article 21 of the Building Service Promotion Act enacted in 2013. Article 17, Article 18 of the Enforcement Decree of the Promotion Act, related to Article 21, shall be as follows.

Article 21 (Revitalization of design competition) ① Public institutions should select characteristics, size, and project suitability for the construction method to revive the construction service industry and improve the quality of public architecture.② excellent public institutions for Presidential Decree in order to create an architecture and the corresponding order for the design of buildings, if the design competition shall be applied in the first place. Design competition criteria and procedures and scope of application of the Presidential Decree is necessary.

Enforcement Decree of the Building Service Industry Promotion Act

Article 17 (First of all application of design competition) ①in a following classification "corresponding to the size and the Presidential Decree for buildings, etc" in paragraph 2. Article 21 of the law.

1. Building which estimated design cost is over posted cost according to Article 4 Clause 1 of Act on Contracts to which the State is a Party.

②If public institutions that place an order for a design do not apply the design competition first by reviewing the public architectural projects plans according to Article 23, the review by the building committee shall be conducted.

Article 18 (design order except design competition) of ① estimated design cost (Design of Presidential Decree) estimates more than 100 million won price, paragraph 3. Article 21 of law.

As can be seen in the section of the Act, when the use of a building is decided according to Appendix 1 of the Enforcement Decree of the Architecture Act, it is allowed to determine if a building is to be used or not, and a project can be planned in advance price review. When organized, these can be summarized in figure 2.

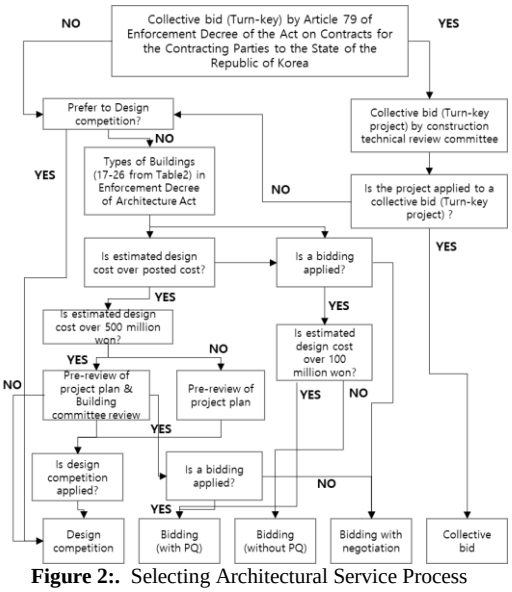


Figure 2:. Selecting Architectural Service Process

3.3 Design Competition System

As reviewed in section 3.2, the most important facilities (due to the cost of multi-use or semi-use construction and 1~16, 17 types of building) are subject to apply design competition system, in case of the estimated design cost is over posted cost. This stage is the most important to those buildings. (However, the other 17~26, 28 types of buildings are special facilities, they are designed to provide various forms of architectural design, including a design competition.) Therefore, design competition is mainly adopted for facilities that are of architectural or public importance, so it is decided that a qualified designer will be selected based on the method of using the recruitment[9,10]. The Ministry of Land, Infrastructure and Transport stated the following in its public notice in 2014.

Notice No. 2014-345 of the Ministry of Land, Infrastructure and Transport (Amendment Notice). 2007-524)

Guidelines for the Operation of Architectural Design Competition

Article 1 (Purpose) This guideline is to establish and implement the construction and operation process of public spaces for the purpose of public design, based on Article 21 of the Building Service Industry Promotion Act, Article 17 of Enforcement Decree, and Article 6 of Enforcement Decree of Construction Project.

Article 2 (Definition of terminology)The terms used in these guidelines are defined as follows.

1. The term "Design Competition" includes the designers (hereinafter referred to as the "Public Service Examination") who have received the public institution's decision under Article 2 Clause 5 of the Building Service Industry Promotion Act (hereinafter referred to as the "Public Service") and the method for involvement of designers by others.

5. General design competition refers to the design competition method that selects a design for constructing or creating a building or a spatial environment by examining all works of space.

6. The term "Second stage design competition" refers to the selection of designers who will participate in secondary examination through the first screening of ideas, and the selection of structures or environments by secondary examination.

7. "Proposal competition " refers to a competition in which design engineers are selected to build or form an architectural or spatial environment by reviewing the experience, competencies, performance plans and methods of the design team.

The above notice is analyzed, then, it can be organized as shown in table 3.

Table3: Design Competition Process

Item	General design competition	Second stage design competition	Proposal competition
Subject	Normal buildings	Large-scale or National wide project	Small-scale project
Time	Leister to submit : 90 days	Leister to submit : 90 days (1st stage : 30days, 2nd stage : 60 days) Reduced 45days	Leister to submit : 15 days
Documents	Drawings, design relief, Study model, 3D images	1st stage: Master plan (except drawings and 3D images) 2nd stage : Drawings and 3D images	Experience, competencies, performance plans (except drawings and 3D images)
Evaluation	By owner	By owner (with presentation)	Quantitative evaluation, Q&A
Compensation	2-4th design firms can be compensated by evaluation committee	Minimum cost	

4. Analyzing Problems in Selecting Architectural services

4.1 Problems with the Design Competition System

When analyzing the contents of the Building Service Industry Promotion Act that was enacted for the advancement of the culture of architecture, it was found that the most important method of selecting designers was design competition [11,12]. Therefore, it can be seen that the design competition is meant to have a well-melted design that includes three elements of architecture, function and beauty. However, it can be recognized that the second stage design competition (first phase) and the proposed competition are selecting designers based on the preparation of a business plan without design relief. Of course, business is well understood, and it is fair to set out the major plans well, but to choose the right person without design relief is to make sure that the main idea is to make sure that the system is set aside and to make a smooth appearance.

4.2 Problems with the Scope of Competition Process

Even for the same purpose, the project performance can be judged only based on the characteristics of the project, but there may be projects that cannot be considered or designed based on the characteristics of the project. However, such projects can be applied to applicants with priority due to the project application. In addition, the method of application cannot be selected based on the size of the project, the owner's management ability, the nature of the project up to the project date, or the level of understanding or implementation of the project up to the design date, and thus cannot be considered for such application.

4.3 Protection in Design Intellectual Property

Article 11 of the Building Service Industry Promotion Act describes the following.

Article 11 (Protection of Intellectual Property) ①The government should carry out the following measures to protect the intellectual property rights of the building services.

1. Protection of Architectural Design Copyright

The reality is going the other way around, although according to the above Act, the copyright on the architectural design must be held by the designer or the company that submitted it. In other words, when a qualified person selects a design through a competition, the designer is empowered to perform the basic design and the actual design. However, during this process, the client continues to express his or her will and make improvements to the design to accommodate the user. That is not to say the least. The reason is that it is the right of the user and the client to draw a design proposal into the intended Functional University, as the individual who uses the building in question would like it to be. In reality, however, the revised design is likely to progress similar to or the same as the design that emerged during the design competition. That is, the design submitted during the design competition is currently unprotected, and the fact that it is placed in the blind spot of copyright protection due to the lack of administrative oversight[13].

Of course, designers or companies who submit a design competition proposal may be compensated for the plagiarized final design by litigation. But it is also realistic that the sued company may not have the opportunity to participate in the design contest again if it does.

4.4 Errors in Complex Processes

As analyzed in this paper, selecting qualified designers requires a very complicated process. Designers can choose basic design processes from the Framework Plan under the Construction Technology Promotion Act or through pre-review project plans and ordering placement under the Construction Service Industry Promotion Act. In addition, suitable designers can be selected through design competition, PQ, and negotiation depending on their qualification criteria. In addition, final designers can be selected through general design competition, second-stage design competition, and proposal competition. It appears that the whole process is explained by the law, and the procedure is carried out without any problems on the surface. But the problem is time. The client shall strive to minimize total project duration in order to have his own building[12,14]. Such conduct is not the only bad thing. It could be a natural story. However, problems can arise significantly if the construction period is significantly longer and less effort is required to enter the design. In the case of a second-stage design competition, the Act provided that the committee can reduce the registration to submission by 90 days to 45 days. After all, they seem to actively encourage poor design and reuse of the design. In addition, any problems, from the initial part of the project to the derivation of the design, could easily delay the time required. So, in this situation, what kind of choice will the client make? Probably, or, of course, they can only pressure designers. In particular, public structures that are not even private structures have to make the utmost efforts to keep the air in place because of a fixed time required. So ultimately, designers can only choose to exchange time and quality.

4.5 Ordering Method that is Inconsistent with the Structure of the Market

As small business owners who usually participate in projects that do not have public offering cannot perform performance assessment, small businesses cannot participate in such projects but are activated due to the expense involved in their participation. In contrast, large businesses are reluctant to participate in the larger projects, as their economic logic is underlying them and their participation is also deteriorating.

5. Alternative to selecting architectural services

5.1 Simplification of Design Competition

A highly sophisticated design approach under various relevant laws is available when the market and the vendor can accept it.

The following table 4shows the 2014 statistics of architectural design firms [6] in Korea

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Table4: Scale of Architectural Design Firms

No.of employee	1~4	5~9	10~19	20~49	Over 50	Total
No.of company	7,377	1,611	455	205	119	9,767
%	75.5	16.5	4.7	2.1	1.2	100

Approximately 76 %, or three-quarters of the total number of architect's firms, consists of less than four. Of course, there are 119 firms with more than 50 employees, but can anyone with less than four employees participate in such a complicated design competition? It is impossible from the beginning. Therefore, it can be inferred that only 28 companies can participate in the event. After all, the design competition is just their own party. Therefore, the current highly sophisticated design competition is ultimately the goal, not reflecting the present situation. Thus, the idea of how to ensure that the design approach is as simplified as possible so that several participants can participate, such as the possible side effects of this process, are to be considered and the involvement of non-fertilizers.

5.2 Protection of Designs

It is true that our intellectual property rights throughout the industry have been neglected for a very long time. It hasn't been long since I've drifted out of community life with no distinction between mine and yours. Of course indiscriminate use of shared ownership or intellectual outcomes has long been embedded in our lifestyles. Under these conditions, a good design can never be seen. It is natural that a strategic approach is needed because design collusion is also an important means of sustaining businesses. A company and its employees can survive only when they have won design competition by any means necessary. As a result, the commercial aspects of the design competition are bound to be strengthened. Once they land a contract, they can easily resist the temptation to choose among the designs. Thus, protection of an engineering proposal submitted by the designer requires that the contractor provide ongoing attention and care to the final design by the winning designer ; and points out that the design participation in the design will require ongoing protection from the contractor.

5.3 Compliance with the Appropriate Design Period

Every project must have consideration of the duration of the project. However, for creative actions, such as eye on design, a certain amount of time is essential. Thus, although it is important to meet the schedule that is appropriate for the business owner's goals, it is essential to ensure adequate time on issues that are not a designer error or responsibility.

6. Conclusion

Korea`s architectural technology is already highly technological, proven globally. The world's tallest building was also constructed by Korean companies, and more than 100 stories of skyscrapers are planned and built in Korea. But unfortunately, it is hard to say that although construction technologies have been proven through numerous cases, they are recognized in the world market for architectural design. To pass away such situations, various legal activities are encouraged or promoted through Act on Contracts to which the State is a Party, Architecture Act, Framework Act on the Construction Industry, Construction Technology Promotion Act, Building Service Industry Promotion Act, Certified Architects Act. However, as problems with the design competition, problems with protection from design, problems of time in complicated processes, and systems that conflict with the market arise, the company is limiting the opportunities for architectural design to advance. Therefore, this thesis presents ways to solve the problem by simplifying the design completion system, ensuring compliance with the design protection device, and complying with the appropriate design period.

As generations and societies change from moment to time, the architectural design sector can demonstrate its capabilities to the fullest when the system is constantly changed and developed accordingly. The research team hopes this paper will serve as a single step to improve our architectural design.

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