



## Environmental-Friendly Amendment of the Non-Resident Supervision Systems for the Private Small Buildings

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### ABSTRACT

Current supervision systems have been changed by the demands of social, physical and institutional environment, and have a role of preventing safety accident and in improving the construct ability through the analysis of issues in quality, time, construction, safety, and environmental management. The public sector "Construction Technology Management Act", a general and private sector "Building Act" and "Certified Architects Act", the residential building "Housing Act" are dealt with supervision systems, respectively, but private small building construction is excluded from the discussion of the main targets because of their relatively small scale and the lack of social interests, Thus, this study focused on the small buildings for improving the non-resident supervision systems.

Survey results revealed that the non-resident supervisor needs to be selected not by clients but by officers in order to obtain its publicity. Based on the proper selection and execution of the supervision system suggested in this study, the potential effects can be summarized as 1) recovering of publicity, 2) correcting abnormal practice, and 3) realizing design intention for increasing the public value of buildings. In addition, findings in this study will be effective to amend current non-resident supervision systems for improving the quality of buildings and communities as well as for adopting the environmental-friendly energy-efficient smart building technologies.

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## 1. Introduction

### 1.1. Research Background and Purpose

The supervision system for construction has developed along with the social and physical progress and now it plays a role in improving constructability and preventing errors by identifying possible problems regarding the construction's quality, process, safety, and environmental management. Under the current construction supervision system, the public sector is supervised under "The Construction Technology Management Act", general buildings in private sector under "The Building Act" and "The Certified Architect Act" and public residences under "The Housing Act".<sup>1)</sup>

While the supervision system has been settled and developed for the public sector and public residences, non-resident supervision for small private construction projects is still limited by the issue of the legitimacy applied to earlier constructions and observance of blueprints. That is, the current construction supervision system has problems in that the laws regarding systems such as "The Building Act", "The Housing Act", and "The Construction Technology Act" overlap causing conflicts in interpreting and applying them. Also,

another problem lies in the fact that advanced supervision has not applied to some sectors.

Therefore, small construction projects in the private sector have deviated from proper supervision due to their negligible scale, and public attention and the sub criteria of small private construction supervision are insufficient as compared to those of the public sector. In addition, the overlap of the laws surrounding the supervision system is closely correlated to safety accidents and the degradation of quality.

In particular, the construction sector has been a major planning target of the national and local governments to build prestigious cities and buildings based on the recent establishment of "The Basic Building Act. Not only that, construction laws such as "The Eco-friendly Construction Support Act" require eco-friendly, energy-saving, and artificial intelligence technologies as well as high environmental functions. To meet such requirements, the importance of architectural design and construction supervision should be emphasized.

Therefore, the purpose of this research will be to analyze from different perspectives the problems regarding the non-resident supervision of small private constructions for the elimination of

irregular practices, and to suggest alternative plans for the advancement of an eco-friendly construction industry and its competitiveness.

## 1.2. Research Scope and Methods

This research is specifically about the construction supervision work for constructing small private buildings, which are the target of non-resident supervision (See Clause 19 of the construction regulations). (Field investigations, inspections and confirmation work according to the 27 provision of the building act will be excluded due to its distance from the construction supervision work.) The order of this research will be as follows: understanding the scope of the supervision work by investigating laws, guides, criteria, and documents relevant to the current construction supervision system; analyzing problems and people's understanding of this matter based on a past questionnaire; prospecting the supervision markets of the small private construction sector through a market analysis; and, finally, presenting conclusions of this research. To sum up,

- 1) A study of the background of the introduction of the supervision system and relevant laws
- 2) An analysis of the current supervision system
- 3) The citation of the questionnaire about the recognition of different individuals involved
- 4) Suggestions for proper applications in terms of the directions of future policies.

## 2. A Study of the Supervision System

### 2.1. The Need for Supervision

The initial plans for a construction job, more often than not, face setbacks and change due to on-site circumstances. These changes inevitably lead to changes of plans, such as a change of methods and techniques to realize the best outcomes. Supervisors, to deal with these situations, are responsible for ensuring the observance of relevant laws and regulations based on design drawings and even modifying or supplementing, as on-site circumstances require.

Even with a good building design, it is difficult to achieve a successful outcome if the construction team doesn't understand the intentions of the design and put them into practice. Most clients hire supervisors to compensate for their lack of professional knowledge and experience. Supervisors, then, monitor to maintain the quality of each procedure to prevent unnecessary re-work, while at the same time working to prevent possible problems during construction.

In Korea, the legal basis ordered by the government for the

supervision of public buildings is in the Construction Technology Management Act and buildings ordered by private industries are supervised on the basis of the Building Act and the Housing Act. Also, electrical installation supervision and fire facility installation supervision are present respectively on the basis of the Electric Technology Management Act and the Fire Construction Act. The definitions are as follows: (1) Clause 2 of the Construction Technology Management Act: the construction business management work which manages the observance of relevant laws, regulations, design drawings and other related documents and instructs workers on the management skills for construction, quality, and safety. (2) The Building Act and Housing Act (Clause 24): 1. Monitor construction teams to ensure they follow design drawings. 2. Monitor the building materials to ensure they satisfy the standards established by law. 3. Monitor that quality tests are performed in constructing residences based on Clause 24 of the Construction Technology Management Act. (3) The Electric Technology Management Act: a construction supervision company monitors the progress of construction to ensure that it follows design drawings and other relevant documents, instructs the workers on the necessary skills for quality, construction and safety, and exercises authority based on relevant laws. (4) The Fire Construction Act: Assuming authority over fire supervision installation, the supervisor ensures that the fire facility installation according to the design drawings and relevant laws and directs the work force with respect to quality and construction management.

The construction supervision system is for advising clients (future residents, in case of public residences) who lack expertise and technical skills to competently supervise and manage construction companies. Authorized architects and professional supervision companies are qualified to perform the supervision.

Also, supervisors manage the overall construction project and monitors each construction site to ensure that it follows the intent of the original design. The growing complexity and diversity of buildings and the advancement of environmental technology make professional and management skills indispensable for reaching goals. The purpose of builders is to ensure a smooth process and the high quality of construction by supervising the overall work. Therefore, it is crucial that a supervisor be equipped with the necessary experiences and qualifications to achieve effective supervision.

### 2.2. The Current Legal System Regarding Supervision

Current laws regarding supervision are roughly divided into "Design Supervision" (Clause 22 of the Construction Technology Act) and "Construction Supervision". Construction supervision is subdivided into the responsible supervision of public construction

companies based on the Construction Technology Act and the general supervision of private companies for general buildings and apartment houses based on the Building Act and the Housing Act. Also, the Electric Technology Management Act and the Fire Defense Act specify electrical and fire construction.

Responsible supervision based on the Construction Technology Management Act is subdivided into complete responsible supervision and partial responsible supervision. Complete responsible supervision covers the entire construction of each contract and partial responsible supervision covers only a portion of the construction of a contract. The targets of current responsible supervision are the public construction companies in charge of 22 major construction projects worth over 20 billion won.

### 2.3. Buildings by Supervision Systems and Supervision Designations

The current Korean supervision system and buildings by the supervision systems mentioned above can be organized as shown in the following table.

To designate supervisors, a construction project has to be permitted as a candidate building based on the Building Act. Supervisors should be designated before the start of construction and carefully chosen in accordance with the use and the scale of the building. That is, multiple-use buildings and apartment buildings with fewer than 20 units can hire a professional supervision company approved by the construction standard management law. A comprehensive supervision company or a certified architect and the supervisors of general buildings are chosen from among certified architects by the owner. Also, apartment buildings with fewer than 300 units should go with certified architects whereas

Table 1. Supervision system

Type	Classification		Law	Authority		
Design Supervision	Public		Construction Technology Management Act	MOLIT		
	ME			MOTIE		
Supervision	Construction Supervision	Public	Engineering Technology Act	MOTIE		
			Private	Building	Construction Technology Management Act	MOLIT
					Building Act	MOLIT
		Residential building		Certified Architects Act	MOLIT	
			Building Act	Construction Technology Management Act	MOLIT	
				Certified Architects Act	MOLIT	
	EFC	Communication construction	Information and Communications Construction Business	MSIP		
			Electric construction	Electric Technology Act	MOTIE	
				Fire construction	Fire Construction Act	MOSPA

\*MOLIT : Ministry of Land, Infrastructure and Transport

\*MOTIE : Ministry of Trade, Industry and Energy

\*MSIP : Ministry of Science, ICT and Future Planning

\*MOSPA : Ministry of Security and Public Administration

those with 300 or more units should be supervised by either a professional supervision company or a comprehensive supervision company qualified under the Construction Standard Management Act. In this case, the head of a local government designates a supervisor for the construction.

The method of supervision can be classified as resident supervision or non-resident supervision, based on the use and the scale of the building. Resident supervision is for the construction of multi-use buildings and buildings (including apartments) whose total floor space exceeds 5000m<sup>2</sup> or 3000m<sup>2</sup> with more than 5 floors. Non-resident supervision is administered for general buildings and the work is done as needed.

Among the different types of buildings mentioned above, our

Table 2. Building by supervision system

Classification		Act		Building	
Supervision	Construction Supervision	Non-resident supervision	Building Act and Certified Architects Act	Building designed by architect	
		Resident supervision		-Sum of floor space is over 5000m <sup>2</sup> -Sum of floor space is over 3000m <sup>2</sup> when over 5 consecutive floor	
	Hosing supervision	Resident supervision	Housing Act	Certified Architects Act	Under 300 household building
				Construction Technology Management Act	Over 300 household building
	Responsible supervision	Full responsible supervision	Construction Technology Management Act		Total cost exceeds 20 billion won and of which industrial technology falls on 22 types
		Partial responsible supervision			Construction works to be placed under the partially responsible supervision shall be construction works other than those specified in Subparagraph 1 that construct major structures as determined by the Ordinance of the Ministry of Land, Transportation and Maritime Affairs, including bridges, tunnels and water gates, and that the contracting authority deems the partially responsible supervision necessary.
Construction inspection				- Except responsible supervision object	

research focuses on non-resident supervision for small private buildings on the basis of Clause 19 of the Building Act. Mid-size buildings and multi-use buildings whose total floor space exceeds 5000m<sup>2</sup> are relatively assured with respect to public interests; whereas on-occasion supervision (calling non-resident supervision downward) for small private buildings has fallen into legal blind spots. In addition, non-resident supervision divides its responsibilities among the owner, the architect, the supervisor and the builder. These characteristics of the supervision explained above has contributed to the lack of public interest, credibility and safety; and, thus, it needs to be addressed thoroughly.

### 2.4. Construction Supervision Classification System

We have reviewed the overall construction supervision system, which will be organized from different aspects according to the following table. The focus of our research is non-resident supervision among private construction projects.

Table 3. Supervision classification system

Design Supervision	Construction Technology Management Act		
Construction supervision	Public	Full responsible supervision	<ul style="list-style-type: none"> <li>■ Construction Technology Management Act</li> <li>■ Total cost exceeds 20 billion won and of which industrial technology falls on 22 types</li> </ul>
		Construction inspection	<ul style="list-style-type: none"> <li>■ Construction Technology Management Act</li> <li>■ Except full responsible supervision</li> </ul>
	Private	Building	<ul style="list-style-type: none"> <li>■ Building Act, Certified Architects Act</li> <li>■ Responsible, residential and Non-residential supervision</li> </ul>
		Residential building	<ul style="list-style-type: none"> <li>■ Housing Act</li> <li>■ Over 20 household</li> </ul>
	EFC	Electric construction	<ul style="list-style-type: none"> <li>■ Electric Technology Act</li> <li>■ Over 600V or over 75KW building</li> </ul>
		Fire construction	<ul style="list-style-type: none"> <li>■ Fire Construction Act</li> <li>■ Over gross area 1,000m<sup>2</sup></li> </ul>
Communication construction		<ul style="list-style-type: none"> <li>■ Information and Communications Construction Business</li> <li>■ Over 6 floor, floor space 5,000m<sup>2</sup></li> </ul>	

## 3. The Current State of Supervisory Operations and Problem Analyses

### 3.1. Supervisory Operation of Buildings on the Basis of The Building Act

In non-resident supervision work, the focus of our research, a client hires a construction supervisor (usually a certified architect) who is paid during the course of construction.

Therefore, the client has a strong incentive to assign both the design and supervisory work to a single entity, which often leads to dumping contracts in the process of setting supervisory prices. These conditions, more often than not, lead to supervisors ignoring

problems, such as design errors and unfavorable on-site circumstances, and pushing the construction through. As a result, defective designs leading to defective constructions are inevitable, which makes it difficult to apply quality, safety and sound construction management. Also, due to the absence of systems to monitor supervisors under the Building Act, the management of supervisors is poorly executed.

The conditions described above bring inherent limitations to supervisory operations, which will result in poor quality buildings and defective constructions.

### 3.2. Legal Problems of the Supervision Operations

Since there are a number of laws affecting the supervisory system, depending on the scale and the use of buildings, it is difficult to ensure the equitable application of laws and establish a comprehensive overview of the system. To be specific, each law regulating the current construction supervisory systems specifies differently the definitions of terms, the targets for supervision, the work scope of supervisors, the costs of supervision, the criteria for deploying supervisors etc., which results in conflicting interpretations and administration of laws.

For responsible supervision under the Housing Act, local governments select companies based on its PQ results and estimate prices. However, non-resident supervision, the focus of this research, designates a supervisor or a supervisory company under the Building Act and this leads to problems.

In constructing small buildings under the Building Act, it is the client and the builder who hire the designer and the supervisor, which results in an inherent conflict of interest on the part of the supervisor to exercise independent supervision. In other words, the right to designate a supervisor belongs to the client and there is a good possibility of the supervisor being replaced if they refuse to follow a client's requests to overlook standards. (See Attachment 1), which impedes the creativity and transparency of the supervisory work.

Also, while the Construction Standard Management Act and the Housing Act specifies the pricing of supervisory work, the Building Act is silent on the matter. Many clients, accordingly, assign the supervisory work to the architects, the designers of the buildings, and don't pay separately for supervisory work. This results from the absence of pricing criteria for supervision, and supervisors under such circumstances have no motivation to do complete and thorough supervisory work.

### 3.3. Problems In Operating the Supervision System

Preceding the supervisory work, a pre-examination is necessary to ensure quality. However, in reality, this is usually not

the case. Since the client and the builder are usually the same in small building projects, a supervisor usually examines the construction after the building is completed, and thus is likely to overlook any errors and proceed if re-work is difficult. Even when illegal acts are discovered, it is unlikely that the supervisor would report them against the client.

As described above, supervisors do have a role and responsibilities under the Building Act, yet it is difficult for them to order re-work in small buildings because the client and the builder are the same. In addition, supervisors are the ones who are reprimanded by the authorities in charge when problems come to light and their responsibilities are far too heavy relative to their roles.

The problems can be summarized as follows.

- 1) The difficulties in quality, safety and construction management
- 2) In cases of small buildings, the supervisory work is done by the designer, designated at the discretion of the client. Supervisors, thus, find it difficult to reject clients' improper requests, which results in the decline of quality in building.
- 3) There are many improper requests made for the sake of the clients' interests and illegal acts on the part of the builders, which leads to substandard building designs and supervisory work.
- 4) Supervisors are likely to receive unreasonable treatment due to their imbalanced responsibilities.

#### 4. An Understanding of the Supervision System and Its Current State

To study how people in the field view the supervisory system, we have organized the results of three surveys. One was conducted in 2004<sup>2)</sup> and another in 2010<sup>3)</sup> by the Korea Institute of Registered Architects and the last one was conducted in 2013 by the Korea Institute of Construction Technology<sup>4)</sup>.

##### 4.1. The Survey of the Supervision System

The survey in 2004 was conducted with those currently working in the construction field about their awareness of the state of the supervisory system. This research referred to general questions from the survey on design supervision and the supervisory system of small buildings.

1) According to the result of the questions on general issues, it turned out that those questioned were mostly concerned about

2) Leejaehoon, Survey of Design · Supervision, 2004, Architectural Institute of Korea, This document was abstracted in internal report in Architectural Institute of Korea.

3) Korea Institute of Registered Architects, Survey of Design and Supervision Separation, 2010, Korea Institute of Registered Architects

4) Korea Institute of Construction Technology, Building supervision enhancement public hearing, 2013.12.13., Korea Institute of Construction Technology

small buildings. The reasons indicated were unrealistic prices, clients' pursuits of personal interests, laws and social circumstances and dumping tradition. On the other hand, the complaints about work load were relatively small, which indicates that satisfactory supervision is attainable with a reasonable fee.

2) The participants answered positively about employing construction technicians or experienced builders as supervisors if the current system is adjusted. On the other hand, 98% of them said that their pays were insufficient compared to their work.

3) For questions about the problems of supervising small buildings, clients' pursuit of interests, lack of technical skills on the part of constructors and insufficient pays were indicated problematic. However, the external pressure or favors for authorities was hardly mentioned.

##### 4.2. The Survey of Authorities and Supervisors

This section is the summary of the results of a survey conducted from May 1st, 2013 to July 19th, 2013<sup>5)</sup>.

1) Analysis on securing independence in supervision : the majority of supervisor respondents answered their work is not quite independent whereas the majority of public official respondents answered neutrally, which indicates that supervisors are more sensitive with this issue.

2) The experience of being disadvantaged when requesting for addressing problems : more than 75% of supervisor respondents said they have experienced disadvantages when requesting for corrections either frequently or occasionally.

3) Analysis of the needs to designate supervisors separately from designers : 52.9% of supervisor respondents said that supervisors should definitely be designated separately from designers whereas 35.3% public official respondents said supervisors need to be separated from designers.

4) Lastly, the results of the survey conducted in 2010 by the Korea Institute of Registered Architects on the separation of supervisors from designers can be organized as followings.

The merits indicated were to receive justifiable supervision payments and to secure the supervisor's status whereas clients' freedom will be limited, which is a disadvantage.

##### Advantages

- Supervisors can receive a reasonable payment and designers can receive a portion of it as a designer supervision fee.
- Designers can engage in the construction procedure if designers are separated from supervision works.

5) Korea Institute of Construction Technology, Building supervision enhancement public hearing, 2013.12.13., Korea Institute of Construction Technology

- Designers can attain a official supervisor position on the field.
- Currently, designers are not supposed to attain a supervisor position after designing phase. The introduction of designer supervision system will render designers official and legal supervisor positions.
- The designer supervision system can lead to new area of the field.
- As technology institutes grow and require its secured area, designer supervision will be helpful for their establishment.

#### Disadvantages

- Clients'right of choice is limited.
- It is possible that architects are limited to designer supervision area and construction and supervision areas are occupied by technicians of other fields or professional supervision companies.
- The introduction of designer supervision system, how to-pay issue has to be addressed.
- If designer supervision system requires extra budget, it is against the government policies and thus difficult to apply. Withdrawing some from supervision budget will bring resistance on part of supervision companies.
- The rotating designation of supervisors like the designer and supervisor rotating separation in the past is not suitable for free competition market and unrealistic. This can result in negative effects such as dumping supervision and the heavy workload on the part of architects with good illegal building handling skills.

Through the analysis of survey results, it turns out that constructing small buildings have problems the most due to unrealistic payment, clients'pursuit of personal interests, the lack of technology of constructors, laws and circumstances and dumping tradition. On the other hand, complaints on workload were low and external pressure or the favor for government authorities were hardly mentioned. The result of survey in 2010 points out the fact that clients are limited on their right of choice as a disadvantage (However, this resulted from the fact that clients designate supervisors in small private buildings and could be an advantage than a disadvantage.) and also indicates that supervisors can have a secured position and a reasonable payment as an advantage. In addition, the 2013 survey results tell us that there have been problems with the independence of supervision works, requesting for corrections and the unacceptable payments caused by overlapping works of designing and supervising. They also mentioned there is a need to separate designers from supervision works.

In other words, to improve supervision system, there has to be

budgets for reasonable supervision expenses and supervisors are supposed to be paid properly. Also, the measure to secure its independence by minimizing pressures from clients and constructors needs to be introduced. This echos with the problem mentioned in section 3, clients'right to designate supervisors, which reassures us that the independence of supervisors and the reasonable supervision payment are necessary.

## 5. Suggestions for Improvements

### 5.1. Directions for Improvements

For more effective supervision, the supervising practices under the building act should be balanced out with those for public interests regulated under other laws such as the construction technology management act and the housing act. Since the purpose of the supervision system is not to pursue personal interests but to secure the safety of the building and the convenience of its users, the supervision system must be directed to satisfy public interests and safety.

The construction supervision is practiced to the buildings liable for permission and the supervisors are liable to report any violation of relevant laws or design drawings on the scene to the client with requests for correction, reconstruction or even putting the construction to a halt, which is their legal duty (the 25 clause of the building act) and crucial for the system itself.

This research focused on the buildings of non-resident supervision and its problems by analyzing the current state of the supervision system. The problem most which should most importantly be addressed is the fact that clients can designate their supervisor at their own discretion and their pursuit of interests and superior position don't get along with the original purpose of the system, which is quality, safety and construction management. In other words, the supervision serves a role of monitoring and supervising the legal matters in construction in lieu of the client. In terms of the legal procedure, impartiality is a must without which a proper supervision operation remains merely as a theory. However, in reality, the fact that the clients can select the supervisors on their own and possibly seek after their interests instead of the independence and impartiality of the procedure is obstructing the healthy function of the system.

Another improper act will be the tradition where the client asks for the supervision works with no charge if the designer gets offered supervision works as well. With this tradition rampant, it is highly incredulous that the supervision services free of charge can be as good as those properly charged.

Lastly, the field of architecture should concentrate its energy on elevating the quality of the architecture and the city. Therefore, it is

required to make sure that the original design is being manifested in construction. And also, designers should be able to involve themselves in the construction procedure to address possible problems occurring on the scene and keep up with the quality of original design. In other words, the designer’s engagement in the construction process and manifesting the design intention accordingly can make a big contribution to improving the building’s quality.

### 5.2. How to Make the Improvements

In cases of private buildings, since the entire procedure is financed by the client, it might be impossible for all of those concerned, the architect, the supervisor and the constructor, to attain independence in their work. However, buildings are supposed to be built safely above all and its public nature should be considered importantly.

The main problem of current supervision system lies in the fact that the client and the constructor is often the same and the client has the absolute right to designate the supervisor and assigns both the design works and the supervision works to the same person or company. To solve this, the right to designate the supervisor should be transferred from the client to the authorities in charge. Then, the improper tradition – asking for free supervision service and unbalancedly heavy responsibilities on the part of supervisors – can be abolished. And also the proposal made by Korea Institute of Construction Technology, which is to include multi-household houses and multi use buildings into a small building category and add them on non-resident supervision lists, can be considered. It would be ideal if the designer can supervise the building he/she designed to achieve integrity. However, considering the realities of the supervisors concerning the relationship with the client not to be fired or discriminated, current supervision system needs to be amended. Therefore, the measure to separate the designer and the supervisor will be effective to secure the independence in the supervision. Lastly, it is also important to come up with a way for a designer to manifest his/her design intention to make the culture of architecture prosper. The following table 6 sums up the contents discussed above.

## 6. Conclusions

### 6.1. Research Conclusion

Buildings are closely linked to our lives and any architect should try to fulfill their mission – design, build and render safe ones. Safe buildings not only depend on good designers and able constructors but also the supervisors handling incessant problems and change of designs during the construction procedure effectively.

The introduction of supervision system plays an important role not only to complete a safe building but also to solve lack of governmental workforce by using manpower in private field, to strengthen supervision function on constructions with new techniques and to improve the quality of buildings by preventing defective constructions.

To this end, the Korean government has addressed the supervision system by enacting new laws and amending existing ones such as The Construction Supervisor in 1962, The Responsible Supervision System in 1994, the extended Construction Technology Act to the private sector in 1997 and the Housing Act in 2003.

However, in case of private buildings, the independence of individual work body, architects as well as constructors and supervisors, are to be deteriorated compared to public constructions because the building belongs to a private party and all the contractors are supposed to be highly affected by their client. Especially, the non-resident supervision, the blind spot in the field, is absolutely favorable to the client, which damages its independence and public nature.

The resident supervision and the responsible supervision, though they belong to private factor, are maintaining their virtuous cycle since they are properly regulated by the laws for its transparency in deploying the supervisors and payment. However, in non-resident supervision field there is no consensus in appointing supervisors in terms of their number and roles, which is understandable considering the size of the buildings. As was discussed in section 4, the non-resident supervision has been

Table 4. Proposed amendment

Classification	Private sector		
	Non-resident supervision	Resident supervision	Full responsible supervision
Object	<ul style="list-style-type: none"> <li>■ Building affected by Building act except resident supervision</li> <li>- Ex) Under floor space 5,000m<sup>2</sup></li> <li>■ Multi-household house and single house</li> </ul>	<ul style="list-style-type: none"> <li>■ Sum of floor space is over 5,000m<sup>2</sup></li> <li>■ Residential building (under 20 household)</li> </ul>	<ul style="list-style-type: none"> <li>■ Multi use building</li> </ul>
Supervisor appointment	Admitter	Client (Resident supervision and full responsible supervision can be secured publicity because of assigned supervision followed by standard.)	
Appointment of supervision is not an architect. And Architect cooperates with construction manager and builder in supervision stage for realizing design intention.			

causing safety and quality problems and damaging the public nature of architecture, which resulted from unrealistic payments, the clients' pursuit of interests, lack of technical skills of constructors, unfavorable circumstances and dumping tradition, the damaged independence of supervisors and their disadvantage.

Therefore, this research largely suggests the transfer of the right to designate supervisors to authorities in charge to satisfy the equitability, the elimination of the destructive tradition, asking for free supervision works if the designer as assigned supervision works as well and paying only for the design, and measures for designers to embody their design intention during the supervision procedure to promote the culture of architecture.

The most noticeable point in our suggestions is to abolish the right for the client to select the supervisor to assure the fairness and transparency in construction, which we believe will result in the following effects.

1) The defective constructions and illegal acts can be eradicated through restoring transparency and environmental decisions are made possible.

2) The inadequate traditions can be straightened to restore the healthy system in construction supervision field and negative public recognitions can be converted to healthy culture of architecture.

3) The designer's intention is respected and thus the realization of it is made possible, which will result in the increase in the buildings' public value

Lastly, the non-resident supervision which has been in the legal blind spot for a long time must be improved so that the quality of architecture and cities can be enhanced and new technologies including eco-friendly, saving-energy, artificial intelligence ones can be effectively applied and introduced. We expect our suggestions will contribute to the development of construction in Korea.

## 6.2. Areas for Further Research

This research only dealt with the problems and solutions surrounding non-resident supervision system. However, further continuous research is required so that the supervision system can be operated more effectively. Followings are the ones this research has not dealt with.

1) The criteria for supervision prices in non-resident supervision market

2) The review of similar cases in foreign countries

Further research should continuously be proceeded on above matters so that the supervision system of Korea can develop in a way that benefits the architecture industry of Korea.

## Acknowledgements

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