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Proposed Amendments to the BUILDING ACT for Improving Construction Monitoring

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SUMMARY

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A series of recent construction accidents have been recognised as a serious problem that threatens people's lives and property, and has strengthened the social demand for securing construction. Under these circumstances, the importance of the Construction Monitoring System, introduced in 2014 as part of policy efforts to strengthen the safety of construction, has been further emphasized.

The Ministry of Land, Infrastructure, and Transport randomly selects some construction sites that have been reported for construction and reviews whether the structural design and material quality meet current standards. The system contributes to preventing construction accidents and ensuring the structural safety and quality of buildings by preventing design errors, poor construction, and the use of defective materials. However, despite the introduction of this system, instances of non-compliance have persisted, unveiling limitations such as an absence of a legal foundation, accompanied by the dearth of specific operational procedures and the absence of subsequent regulatory frameworks. These limitations call into question the efficacy of construction monitoring and underscore the necessity for enhancement and augmentation of the system.

The present study aims to redefine the concept and scope of construction monitoring, clarify the roles of stakeholders in the monitoring process, and propose ways to strengthen the legal and policy bases so that practical improvements can be made. It also aims to propose specific legislative amendments to enhance the completeness and operational efficiency of the system by reflecting the opinions of various stakeholders.

- Research Purpose : Strengthening the effectiveness of construction monitoring
- Research Objectives : Construction Safety Monitoring (corresponding to the name of the project currently being implemented by the Ministry of Land, Infrastructure, and Transport)
- Research Scope

① Establishment of legal basis to increase the effectiveness of 'construction monitoring' by reorganizing 'building monitoring' regulations in current laws and regulations

② Provide a direction to improve the completeness of the system by evaluating the policy feasibility along with the systematic overhaul of related regulations

Current Status and Issues of Construction Monitoring System

In the Republic of Korea, a range of building inspection systems are in operation with the aim of ensuring the safety and performance of construction. At the design stage, the building committee is responsible for conducting structural safety checks and deliberations. During construction, the construction supervisor is tasked with checking the quality of materials and compliance with design documents. In the maintenance and management stage, building managers ensure the safety of construction through regular inspections. Despite the multiple levels of construction inspections in place, limitations in the system must be acknowledged. The licence holder's inspections are indirect,

primarily through documentation, and the licence holder is not involved in the direct inspection of sites. In an effort to address this issue, regional construction centers were established in 2017 as a preliminary technical review body for building permit books. However, due to limitations in terms of professional manpower and budget, these centers are unable to conduct direct site inspections.

In response to these limitations, the Ministry of Land, Infrastructure, and Transport operates the Building Material Quality Certification System and the Construction Monitoring System to address the deficiencies in on-site management. The primary function of these two systems is to verify the safety of structures and materials during the design and construction phases of buildings. Notably, the Construction Monitoring System conducts unannounced inspections at construction sites to ensure that the structural design and material quality comply with current standards. The system's capacity to identify structural issues that may have been inadvertently or deliberately excluded during the design stage, in addition to its ability to highlight areas of oversight in the construction phase, is particularly noteworthy. Construction monitoring functions as an autonomous verification system for construction, thereby enhancing awareness of the responsibility of building officials and contributing to the enhancement of construction.

Nevertheless, the construction monitoring system is problematic. Primarily, a discrepancy exists between the legal definition of 'construction monitoring' and the business definition of 'construction monitoring'. The legal definition of 'construction monitoring' focuses on reviewing the adequacy of standards, while the business definition of 'construction monitoring' is mainly based on unannounced inspections at construction sites. This discrepancy engenders a divergence between the legal framework and the practical operational activities, which may compromise the clarity and consistency of the system. Secondly, there is a paucity of statutory provisions on monitoring methods and procedures, which requires reference to other regulations to compensate. Presently, there are no specific regulations on monitoring methods and procedures in enforcement regulations such as the Building Code. Instead, the procedures for professional organizations are set out in the notification of the Ministry of Land, Infrastructure, Transport, and Tourism. This has resulted in a lack of hierarchy within the legal system, which may consequently reduce the consistency and legal stability of the monitoring system. Thirdly, in the event of violations being identified

during monitoring, there is an absence of clear provisions for subsequent measures, thus limiting the efficacy of the system.

To address these concerns, it is imperative to reinforce the legal and policy framework underpinning the construction monitoring initiative. This should be achieved by introducing more precise regulations within the Building Act. Furthermore, to enhance the efficiency and effectiveness of the system, it is essential to undertake a thorough review of the regulations pertaining to professional organizations, follow-up measures, and penalties.

Relevant Stakeholder feedback on the Construction monitoring system

Surveys and interviews conducted with the public, experts, and local government officials demonstrated that the construction monitoring system is generally supported. The general public recognised the importance of construction monitoring in ensuring public safety, ensuring the safety of building structures and materials, preparing for extreme weather and natural disasters, and preventing major accidents. A total of 92.5 per cent of respondents agreed that the policy is necessary. The mean willingness to pay (WTP) of the general public was approximately KRW 44,226 per year, and the total annual benefit was estimated to be around KRW 980.9 billion. The current budget for the construction monitoring project is inadequate in comparison to public expectations. A comprehensive review of public expectations and the economic value of the system is recommended, with a view to determining the allocation of policy resources and the possibility of expanding the budget.

In order to enhance the effectiveness of the construction monitoring system, experts have proposed the following measures. These measures include a thorough revision of the legal concept, the empowerment of professional organizations, the enhancement of local government coordination, the refinement of consequence measures, and the augmentation of operational efficiency. The necessity to enhance the clarity and enforceability of the system, to clarify the role of professional organizations, and to

develop a more systematic follow-up system for monitoring results was also emphasized by experts.

Local government officials also generally concurred on the necessity for a construction monitoring policy, with 74% of respondents expressing a positive view on improving the system. However, they perceived that the current local government organizational system is not well prepared for the expansion of the programme, and pointed to the need to expand the number of building administration staff and strengthen professional training as key challenges.

In light of the aforementioned stakeholders' perspectives, the following priorities should be addressed to enhance the comprehensiveness of the construction monitoring system. In the short term, it is necessary to compensate for the insufficient legal basis and to establish a training system to strengthen the professionalism of local government officials using monitoring results. Furthermore, in the longer term, there is a need to consider the expansion of municipal building administration staff to enable licence holders to play a more proactive role in construction inspections.

Current status of Construction monitoring projects and identification of issues

Construction monitoring projects are divided into the structural and material sectors, and each sector adopts a distinct approach in terms of organization, procedures, selection of monitoring targets, inspection methods, analysis of results, and follow-up measures.

- Structural sector

The monitoring of reinforced concrete buildings is conducted within 30 to 90 days of the notification of commencement of construction. The selection of buildings is conducted randomly, with factors such as region, size, structural type and use being taken into account. The aforementioned parameters include, but are not limited to, apartment buildings, single-family homes, neighbourhood living facilities, business facilities, and

cultural and assembly facilities. The monitoring process involves a meticulous examination of the structural designs submitted alongside building licences, with a focus on the adequacy of structural calculations.

Of the buildings selected for structural monitoring from 2017 to 2023, the rate of completion was found to be low in key areas such as seismic loads and member design, indicating the need for further improvements. The most prevalent non-compliance cases included the absence of design documents, load calculation errors, and member design errors, with discrepancies between the structural bills and structural drawings being frequently observed.

The follow-up survey revealed that administrative penalties for non-compliance cases were predominantly imposed on architects under the Architects Act. While the penalties encompass disciplinary requests, suspension of qualifications, and fines, no cases involving penalties against structural engineers were identified. Furthermore, there was a lack of systematic reporting of the status of disciplinary procedures conducted by local governments to professional organizations or the Ministry of Land, Infrastructure, Transport and Tourism. In order to address these issues, it is necessary to establish a management system to improve the efficiency and reliability of follow-up actions.

The review of the adequacy of the standards in the structural sector reveals that 14 of the 41 proposed improvements (approximately 34%) have been incorporated into the standards. This includes the Piloti structural design method and the criteria for applying special seismic loads, which have been improved through the revision of the standards. Nevertheless, the necessity to establish a legal basis for the monitoring project, to strengthen sanctions for poor designers, to standardize administrative procedures, and so forth, remains unaddressed.

- Materials sector

The monitoring of the materials sector involves the inspection of the construction status and performance of various materials, including fire compartment members, composite materials, and insulation materials, with the objective of ensuring fire safety. Since 2014, the scope of monitoring has undergone a gradual expansion, encompassing fire doors and fire shutters, with a primary focus on factories, residential neighborhoods, and apartment buildings characterless by high fire loads. The monitoring process involves site inspections and the collection of material samples to assess flame retardant

performance and ensure material quality conforms to standards.

From 2017 to 2022, a significant number of insulation and composite materials in the monitored buildings in the materials sector exhibited non-compliance, with a notable discrepancy between test reports and actual construction materials identified as a primary concern. A number of non-compliance cases were also identified in the fire resistance performance test and construction status inspection of fire doors and fire shutters. Even after remedial measures had been implemented, additional management was required to ensure complete improvement.

Administrative penalties, derived from monitoring outcomes, are directed at supervisors and contractors, and are principally grounded in Article 52.3 (Violations in the manufacture and distribution of building materials, quality certification) of the Building Code. The significance of material quality control has been underscored, and as a consequence, administrative penalties for the utilization of defective materials or the distribution of substandard materials have been augmented. Nevertheless, it should be noted that there have been instances where manufacturers and contractors have contested the process of quality certification cancellation, which has consequently led to the initiation of administrative litigation. This suggests the need for improvement to the system to ensure the reliability and fairness of administrative measures.

A content analysis of the review of the adequacy of standards in the material field reveals that the primary recommendations pertained to material management, follow-up measures, the KS certification system, and supervision checklists. Nevertheless, despite these recommendations for enhancing standards, the review and improvement activities based on the findings of construction monitoring have not been established as a significant project, and the actual improvement performance has been inadequate. This is primarily due to the absence of a formal consultative body to revise standards and the lack of a systematic management of the revision process. Consequently, there is a necessity to systematics the process of improving standards by effectively utilizing monitoring results, and to establish a consultative body and operating procedures to support it.

Proposal for the enhancement of the Construction monitoring system

The present study focused on addressing the discrepancies between the legal definition of construction monitoring and its actual operation, ensuring procedural legitimacy in the monitoring process, and refining follow-up and penalty provisions. The following improvements have been made:

- Clarification of the definition and scope of construction monitoring

The title and definition of 'construction monitoring' in the current Building Code has been revised and changed to 'construction monitoring' to align with the actual business content, and clarified to include active monitoring activities to ensure compliance with structural and material standards during the design and construction phases. Furthermore, the role and purpose of standard adequacy review and monitoring have been separated to distinguish their respective roles and purposes.

- Clarification of methods and procedures for conducting monitoring

The procedures for selecting buildings to be monitored, reviewing plans and materials, notifying results, appealing, following up, and completing the process have been clarified. The roles of the permit holder and building officials have been elucidated, necessary data submission requests and cooperation rules have been established, and follow-up measures such as redesign, reinforcement, and suspension of construction based on monitoring results have been strengthened.

- Strengthening the authority and responsibility of monitoring organizations

The monitoring tasks were entrusted to professional organizations, the qualification requirements and personnel standards of which were expanded, and accountability was strengthened by applying the civil service agenda to the staff of said organizations. Furthermore, the monitoring system was transitioned from agency to entrustment, with the objective of enhancing the consistency and timeliness of monitoring tasks.

- Establishment and strengthening of penalty and fine regulations

Penalties and fines were established for failure to implement measures resulting from monitoring results, or for interference with the work. Penalties were also applied to minor cases of poor design, with a view to enhancing the effectiveness of the system.

- Introduction of electronic information processing system and disclosure of results

In order to efficiently manage the process and results of monitoring, regulations have been established to utilize electronic information processing systems (e.g., the Building Administration System Centre), and the results of monitoring and follow-up actions have been made public to ensure administrative transparency and the public's right to know.

Conclusion and Future Challenges

This study analysed the current status and issues pertaining to the construction monitoring system, with a view to ensuring the safety of construction. It also suggested ways in which the system could be improved. The study's findings revealed deficiencies in the legal foundation and operational framework of the system, with unclear monitoring targets and procedures, and inadequate follow-up and sanction provisions. To address these issues, the following improvements were proposed.

Firstly, the legal foundation should be strengthened by changing the title of the regulations, defining terms, and clarifying operating procedures and methods to ensure legal stability and clarity. Secondly, the study recommended the empowerment of professional organizations, entrusting monitoring tasks to these entities and establishing regulations for the implementation of civil service agendas. Thirdly, the establishment of a system of penalties and financial sanctions is proposed, in order to ensure the effectiveness of the new measures. Fourthly, the active involvement of building officials should be encouraged through the utilization of digital systems and the provision of incentives for efficient operation.

The study further proposes a series of follow-up tasks to promote sustainable development, including the formulation of comprehensive operational guidelines for each structural and material sector, as well as the establishment of a system for the dissemination of monitoring results. It is anticipated that this study will contribute to the strengthening of the legal and policy basis of the construction monitoring system, the improvement of operational efficiency, and the assurance of public safety.

Keywords :
Building Safety, Construction Safety, Monitoring, Building Act, Structure, Materials, Building Standards