

## 생애주기를 고려한 공작물 관리체계 마련 연구

A Study on Establishing a System for Managing Nonbuilding Structures by Considering Life Cycle

현태환 Hyeon, Taehwan  
박종훈 Park, Jonghoon

( a u r i

---

# A Study on Establishing a System for Managing Nonbuilding Structures by Considering Life Cycle

Hyeon, Taehwan  
Park, Jonghoon

---

## Introduction

The safety of the people's living environments is now threatened by climate change. This is due to a growing concern over the increase in and continuation of the casualties and property damages caused by storms and floods that have become even more powerful than before due to climate change. Accordingly, the government has selected "Establishing an Advanced Disaster and Safety Management System" as a presidential agenda to emphasize the need to create a living environment that can protect the lives and property of the people and is promoting the creation of a safe living environment by establishing a daily safety monitoring system and the comprehensive maintenance of areas vulnerable to storms and floods. There is an urgent need to establish countermeasures as the safety accidents involving various nonbuilding structures and facilities, and the living environment closely related to the lives of the people, are increasing due to storms and floods. The types and sizes of nonbuilding structures have diversified and their quantity has increased with the advancement of the construction and structural technology, and the installation of nonbuilding structures in dangerous areas is increasing as available land in urban area has decreased. On the other hand, some independent facilities, such as mechanical parking lots and chimneys, lack proper maintenance and inspection systems, and with the increase in large-scale facilities, casualties and property damages are increasing when accidents occur; however, the management measures for these nonbuilding structures are still inadequate.

The insufficiency of the current system for the construction and maintenance of the nonbuilding structures has also been highlighted as a problem. The indiscriminate construction of large nonbuilding structures is possible because there is no requirement for permits when installing large building structures, and the loss of life and property damage due to accidents is increasing from the lack of maintenance and inspection of these structures. In particular, there is a high risk of safety accidents for nonbuilding structures located in elevated positions within cities that are left unattended for a long period of time due to the lack of safety-related regulations. A life cycle management system must be introduced to ensure the safety of poorly managed nonbuilding structures, and to achieve this, it is necessary to establish a clear standard on permits, as well as establishing a systematic maintenance and inspection system. However, despite the need for a maintenance system to ensure the safety of nonbuilding structures, when the Building Management Act came into force, the provisions on the maintenance of nonbuilding structures subjected to construction reports under the existing Building Act were deleted. Accordingly, there is an urgent need for a legal reform, as institutional grounds to maintain and manage these nonbuilding structures are no longer available. Moreover, the grounds for the targets of inspection and procedures must be strengthened, the various actions pursuant to the life cycle management must be regulated, and the safety of the nonbuilding structures must be improved through the aligning laws and systems.

Therefore, the purpose of this study is to clarify the definition of the nonbuilding structures subjected to the life cycle management, to introduce a management system of the nonbuilding structures requiring safety and maintenance, as they are closely related to the safety of the people's lives, to present a management plan for the nonbuilding structures that must be managed according to their life cycle, and to present legislative improvement plans and legislations in order to link and systematize the related laws.

## **Analysis of the Status of the Nonbuilding Structures and Consideration of the Institutional Changes**

Chapter 2 diagnosed the legal and institutional problems in the maintenance of the nonbuilding structures through analyzing the status of the nonbuilding structures and considering the institutional changes. The analysis of the status of the nonbuilding structure was conducted through analyzing the nonbuilding structure accident cases and

analyzing the current status of construction and management of the nonbuilding structures. The history of the system on the nonbuilding structures was examined through changes in the nonbuilding structures subjected to the construction report under the Building Act and the introduction of a maintenance and management system.

Accident statistics are not prepared and published for nonbuilding structure accidents; therefore, an analysis was conducted on the nonbuilding structure accidents that were reported by the media over the past 20 years. The result of the Big Kinds analysis shows that a total of 126 cases of the nonbuilding structure accidents were reported for the nonbuilding structures subjected to the construction report under the Building Act. Accidents for mechanical parking lot were reported the most with 50 cases, and accidents also occurred for retaining walls, chimneys, spires and advertising boards, etc. Many accidents occurred due to falls from a mechanical malfunction, driver error or manager negligence in case of accidents at mechanical parking lots. For nonbuilding structures that were attached to the roof of a building, such as a spire, advertising tower or steel tower, or were long, accidents caused by collapsing and falling mainly occurred due to natural disasters, such as typhoons, etc. On the other hand, in the case of heavy concrete structures, such as chimneys and retaining walls, most accidents occurred due to collapse during construction or repair and reinforcement. Casualties caused by the nonbuilding structure accidents were also serious. Of the 126 nonbuilding structure accident cases, 82 resulted in human casualties, and 57 of the 82 cases resulted in death, including accidents while dismantling the nonbuilding structures. Looking at individual nonbuilding structures, in the case of chimneys, accident risk prevention measures were needed due to the deterioration of urban aesthetics and the increased risk of collapse due to aging. Mechanical parking lots required supplementary measures for managing blind spots by increasing the number of managers on duty and strengthening the safety management standards, and in the case of advertising boards, detailed regulations were needed to prevent falling accidents.

The analysis of the construction status of nonbuilding structures utilized the “nonbuilding structure ledger” within the “Architectural Administration System (Seumteo),” which is currently accumulating data on nonbuilding structures. The total number of nonbuilding structures reported for construction was 418,533, according to the nonbuilding structure ledger from Seumteo, the architectural administration system of South Korea. Retaining walls were reported to be the most for construction, with



321,766, among all nonbuilding structures, followed by walls, iron-framed fabricated parking lots, and golf practice ranges. By metropolitan local government, Gyeonggi-do recorded the largest number of constructions with 279,220 units, accounting for 66.7%, followed by Jeollanam-do, Incheon and Gyeongsangnam-do. According to the special-purpose area, the largest number of construction reports was in the planned control area, with 128,820 nonbuilding structures, and most of them were retaining walls. According to the special-purpose zone, the ratio of nonbuilding structures was relatively high in the livestock-raising restriction zone, development restriction zone and district-unit planning zone. The number of years elapsed for nonbuilding structures that were reported for construction indicate that 412,724 structures were constructed within 20 years, accounting for 98.6% of all nonbuilding structures. By the type of nonbuilding structures, the proportion of retaining walls built within 10 years was very high, at approximately 250,000, and in the case of iron-framed fabricated parking lots, golf practice range steel towers, mechanical parking lots and advertising towers, the ratio of elapsed years was relatively high at 10~15 years. By height, most retaining walls and walls were less than 4m, most chimneys were 10~30m, and most decorative towers, monuments, elevated water tanks and advertising towers were 10~20m. The implications were: it is necessary to set different management standards for nonbuilding structures in urban areas and controlled areas; it is necessary to strengthen the management of the nonbuilding structures, such as mechanical parking lots, chimneys, steel towers and walls, etc., in the urban areas, as the nonbuilding structures construction ratio is high; it is necessary to prepare a management plan for the nonbuilding structures that have not been reported for construction; it is necessary to strengthen the measures for the structural safety of the nonbuilding structures; and it is necessary to build a database of nonbuilding structures that must be managed institutionally.

Moreover, the evolution of the nonbuilding structure construction and the maintenance system was summarized through this study. The nonbuilding structure construction system under the Building Act was enacted when the Building Act was enacted in 1962, and the construction of a nonbuilding structure was subject to permission. With the amendment of Article 100 of the Enforcement Decree of the Building Act in 1982, the submission of a construction permit was omitted for nonbuilding structures built on the same site when constructing a new building. In 1990, entering a building structure management ledger

when constructing a building structure became mandatory. In 1992, with the introduction of the building reporting system, the construction of nonbuilding structures was also changed to a reporting system. In 1997, the penalty provisions were strengthened by stipulating a provision for reporting the existing nonbuilding structures to prevent unconstitutionality, and clarified the application of penalties for failure to report.

### **Analysis of the Current Building and Nonbuilding Structure Construction Legal System**

In Chapter 3, the analysis of the licensing and construction system for domestic buildings and facilities, interviews with public officials and experts to derive the matters needed to improve the nonbuilding structure construction system, and the analysis of overseas cases were conducted to improve the construction system for nonbuilding structures subject to construction reports under the Building Act.

The building construction system under the Building Act is classified into a building permit and report system, the commencement and completion of the construction works system, and the building construction deliberation system. The building permit and report system requires that the building reports and building permits be issued in accordance with the total floor area, number of floors, use, etc. of the building type during new construction, reconstruction, extension, renovation or the major repairs of a building, and requires permission from the head of the local government depending on the total floor area and number of floors and according to new construction or major repairs. The building commencement and completion of the construction system is divided into a construction commencement report and approval for use, and the construction commencement report specifies matters related to the construction plan report and change report, and whether or not to notify after reporting, etc. For approval for use, the building supervisor applies for the approval for use to the competent permitting authority accompanied by a report on the completion of supervision and the drawings and specifications for the completed project, and the competent permitting authority permits the approval for use after review. Deliberations related to the construction of buildings under the building construction deliberation system are construction plan deliberation, structural safety deliberation and excavation deliberation. Among these, the construction deliberation stipulates that the size of multi-use facilities, etc. should be specified and deliberated. In the facility construction

system, it was analyzed that the activity restrictions and permission issues and permission to occupy facility construction land were important. The subject matter of activity restrictions and permissions was that permission from the relevant agencies and heads of local governments must be obtained when constructing and building facilities, such as bridges, overpasses and tunnels. Permission to occupy facility construction land stipulated that permission to occupy is required for roads, rivers and ports where facilities, such as bridges, overpasses and tunnels, are constructed. For the application of the construction report of nonbuilding structures during the new construction of buildings, it was confirmed that the construction report for nonbuilding structures is mandatory pursuant to the Building Act and the Enforcement Decree of the Building Act, but administrative management on the nonbuilding structures was lax because when constructing a new building, the submission of the construction report for the nonbuilding structure and the structural safety checklist could be omitted in the case of nonbuilding structures built on the same site. In the case of a construction report for nonbuilding structures built separately from a building, the construction report must be submitted to the head of the local government, and the submission of the construction report for the nonbuilding structure is mandatory when reporting the construction. The nonbuilding structure management ledger is created for the submitted construction information, and they are preserved and managed in the construction administration information system.

The National Land Planning and Utilization Act also includes the installation of nonbuilding structures as subject to permission for development activities and included regulations on the installation of nonbuilding structures and matters related to permissions. In addition to the above two laws, the nonbuilding structures are mentioned in 73 laws, 59 enforcement decrees and 54 enforcement rules, indicating that they are the subject of various legal subjects and legal actions.

Overseas cases on the permission process for individual nonbuilding structures were examined. In the case of Fairfax County in the USA, the retaining walls are divided into residential and commercial for permits and approvals, and the applications are made online by attaching a construction plan, based on the Construction Law and ordinances. For a procedure for an advertising board permit, in the case of Seattle in the USA, it was divided into on-premise advertising boards attached to corporate and store buildings, and off-premise advertising boards built on land. In the case of the Village of Country

Club , Andrew County, Missouri, USA, the permission process was similar to that of Seattle, with detailed regulations on the advertising board permit expiration, actions for violations, appeals procedures and the taxation of profits. Oklahoma City, USA, manages the petroleum manufacturing facility permits under the Air Quality Management Act, and the air pollution-related regulations are applied to various facility installation standards and are reviewed at the time of construction for permits and approvals. The permit process for rooftop solar power systems in the US was analyzed for solar power systems, and organized regulations, such as structural requirements linked to rooftop structures and cooperation with local fire authorities for fire safety.

As for the implications, first, it is necessary to introduce a permit and reporting system for the construction of nonbuilding structures. To this end, it is proposed that priority should be given to organizing the legal concepts of permits and reporting. Moreover, it is necessary to introduce a permit and reporting system that takes into account the size and construction area when constructing the nonbuilding structures. Here, in order to introduce a reasonable nonbuilding structure construction system, it is also suggested that there is a need to relax the current reporting process into a self-complete reporting process for structures that are not closely related to public safety. It is also suggested that a change in the method of creating and managing the nonbuilding structure management ledger is necessary. It is necessary to identify and manage the current status of nonbuilding structures in order to improve the current situation where there is a high risk of poor management due to the omission of the construction report, and it is necessary to change the procedure for creating the nonbuilding structure management ledger. The need to introduce an inspection system for a nonbuilding structure construction completion (approval for use) by improving the structural safety checklist is also presented. Specifically, it is necessary to establish a new delegation provision that would allow structural experts and engineers to prepare and review the structural safety checklist in order to strengthen expertise in verifying the structural safety of the completed nonbuilding structures. The need to respond to various types of nonbuilding structures created in response to social changes is also suggested, such as hybrid power generation facilities installed on the rooftops of buildings, eco-friendly energy facilities (solar and wind power generation facilities) attached to buildings, and vertiports dedicated to urban air mobility (UAM) installed on the building roofs, etc. Moreover,

the need to distinguish procedures from construction to the dismantling of temporary and semi-permanent nonbuilding structures is also presented. Other suggestions for the nonbuilding structure construction system are the need to improve the system by omitting unnecessary approval and permit procedures for minor activities and the need to prepare measures to improve the drawing notation method for nonbuilding structures that are not subjected to the mandatory construction report.

## **Analysis of the Current Building and Nonbuilding Structure Maintenance, Management and Dismantling System**

In Chapter 4, an analysis was conducted on the inspection, maintenance, management and dismantling system for domestic building and appurtenant facilities associated with or attached to buildings, as well as the current nonbuilding structure maintenance-related system, for improving the nonbuilding structure maintenance, management and dismantling system. Moreover, interviews with public officials and experts and the analysis of overseas nonbuilding structure maintenance cases were performed to identify the improvements to be made to the maintenance, management and dismantling system.

As an inspection system for building maintenance and safety, the Building Management Act stipulates regular inspections on multi-use or semi-multi-use buildings and special structure buildings with a total floor area of 3,000m<sup>2</sup> or more, as well as emergency inspections, the inspection on small old buildings and safety diagnosis. The Act on the Safety and Maintenance of Educational Facilities stipulates educational facilities, such as kindergartens and schools, as subject to safety inspections, and the Multi-family Housing Management Act stipulates multi-family housing subject to mandatory management as subject to safety inspections. Moreover, the Special Act on the Safety Control and Maintenance of Establishments stipulates the periodic safety inspection, full safety inspection and emergency safety inspection of class 1, 2 and 3 establishments. The Special Act on the Safety Control of Publicly Used Establishments and the Act on Installation and Management of Firefighting Systems mostly provide for fire safety inspections.

Mandatory building maintenance pursuant to the Building Act, as a system for the safety and maintenance of nonbuilding structures in Korea began with the enactment of Article 7-3 of the Building Act in 1973, and the maintenance of nonbuilding structures also

became mandatory with the establishment of the applicable provisions for nonbuilding structures. In 2014, the submission of structural safety checklist upon construction of nonbuilding structure became mandatory. In 2020, the submission of structural safety and earthquake-resistant design confirmation became mandatory, and in 2021, the submission of the wind-resistant design confirmation became mandatory due to the new wind-resistant safety regulations for nonbuilding structures. However, with the implementation of the Building Management Act in 2020, the nonbuilding structure management provisions in the Building Act were deleted, so currently, there is no integrated maintenance and safety inspection system for nonbuilding structures.

The cases of the individual nonbuilding structure in the US was analyzed to examine the overseas nonbuilding structure maintenance systems. For chimneys, an annual inspection is conducted by distinguishing the level of deterioration, and experts perform the chimney inspections and repairs. In the case of old chimneys, the safety of the chimney is secured through maintenance via the application of a lining. In the case of elevated water tanks, as the storage capacity is large, the material itself must have a high water resistance and durability, and it is important to withstand continuous water pressure and maintain major welded areas to prevent the structure from collapsing.

The need to establish a new maintenance provision for nonbuilding structures subject to construction reports and the need to manage nonbuilding structures within the same land as the building, nonbuilding structures that are not on the same land as the building, the dismantling of nonbuilding structures and the long-term abandoned nonbuilding structures are presented as implications. It is suggested that a system improvement plan is necessary by first adding a nonbuilding structure maintenance provision that had been deleted from the Building Act to the Building Management Act. In the case of the nonbuilding structure located on the same land as the building, it is suggested that inspections should be mandatory for the nonbuilding structures subject to construction reports, as well as non-subject nonbuilding structures, located on the same land as the buildings subject to the regular inspection under the Building Management Act in order to strengthen the nonbuilding structure inspection located on the same land as the building subject to the regular inspection. As for the nonbuilding structures not located on the same land as the building, it is suggested that, similar to the maintenance provision of the Building Act, the owners and managers of the nonbuilding structures should perform inspections. A system is necessary for the dismantling of nonbuilding



structures and to manage the long-term neglected nonbuilding structures. The dismantling of nonbuilding structures should be managed along with the dismantling of the building on the same land, and the long-term abandoned nonbuilding structures need a system that encourages the owner to dismantle through the local government management, as these nonbuilding structures have been left abandoned for a long period of time and can be incredibly vulnerable to collapse or fire due to structural defects or electrical problems.

### Measures to Improve the Nonbuilding Structure System in Consideration of the Life Cycle

In Chapter 5, the direction of improving the nonbuilding structure system in consideration of the life cycle, a plan to revise the Building Act and its subordinate laws for the systematic management of nonbuilding structures, and the enactment of laws on the construction and management of nonbuilding structures are presented.

The concept and scope of nonbuilding structures are established in the direction of improving the nonbuilding structure management system in consideration of the life cycle. The legal definition for the nonbuilding structure is suggested as ‘an artificial facility or structure that is artificially manufactured or fixed to the ground as a land fixture, or is indirectly connected to the land and requires management and preservation.’ In order to establish a scope of the nonbuilding structure, the nonbuilding structure is classified into four categories: land settlement and connectivity, period of use of the nonbuilding structure, whether they are combined with the building, and the location of the nonbuilding structure construction. First, the nonbuilding structure settled on land and the nonbuilding structure combined indirectly with the land generally refer to floating nonbuilding structures. The second classification is the temporary nonbuilding structure and (semi) permanent nonbuilding structure. The third classification is the nonbuilding structure built on land and the nonbuilding structure built not on land. The fourth classification is the nonbuilding structure attached to a building and nonbuilding structure built separately.

Three conditions are suggested to become the nonbuilding structure to be managed by the building-related laws. They are: (1) is it a nonbuilding structure that needs to be managed to create a safe living environment; (2) is it a nonbuilding structure that can be controlled under the current national and local government capabilities; and (3) is it a

nonbuilding structure that can be managed by the entity that has been given the duty to manage the nonbuilding structure.

By combining the concept, the classification standards and consideration for nonbuilding structures to be managed institutionally, the nonbuilding structures to be managed under building-related laws are called “appurtenant nonbuilding structures” and defined as follows.

‘Appurtenant Nonbuilding Structure’ refers to the nonbuilding structure constructed within the land under Article 2, Paragraph 1, Item 1 of the Building Act that the functions appurtenant to the use of the building and the land, including retaining walls, chimneys, advertising towers, elevated water tanks, underground shelters and other similar structures prescribed by the Presidential Decree.

As directions for improving the nonbuilding structure management system according to the life cycle, the directions for improving the construction system, the direction for improving the inspection and maintenance system for the nonbuilding structures, and the direction for improving the system for stable dismantling are proposed, and the details of each system improvement are as follows.

To improve the construction system for safe nonbuilding structures, introducing a reporting and permit system to strengthen the management of nonbuilding structures during construction, improving the method of creating a nonbuilding structure management ledger to manage the nonbuilding structures, improving the structural safety checklist to review the safety of nonbuilding structures, and improving the system in preparation of constructing new types of nonbuilding structures are proposed.

In the improvement of the system for the inspection and maintenance of nonbuilding structures, including new provisions to the Building Management Act to systematize nonbuilding structure maintenance and management, improvements to classify the inspection and maintenance methods by the construction method of nonbuilding structures, and the improvement plans for creating a database of the nonbuilding structure maintenance inspection information are presented.

Regulations mandating reflecting the dismantling plan and dismantling report of nonbuilding structures to the building dismantling report to ensure the safe dismantling of the nonbuilding structure was proposed, and the suggested directions for improving the dismantling of long-term abandoned nonbuilding structures and temporary-use nonbuilding structures.

< Improvement of the nonbuilding structure management system according to the life cycle and the legislation subject to revision >

Life Cycle	Need Improvement	Improvement (Proposed)	Laws Subjected to Amendment and Enactment (Proposed)
Construction	Ambiguous definition of the nonbuilding structure requiring systematic management	→ Include the definition of the nonbuilding structure: Appurtenant nonbuilding structure	→ Building Act – Article 2 (Definitions) Enforcement Decree of the Building Act – Article 3-6 (Types of Appurtenant Nonbuilding Structures)
	Uniform reporting system without considering the characteristics of each type of the nonbuilding structure	→ Establish a new permit system for nonbuilding structures built in the specific area among the nonbuilding structures over a certain size	→ Building Act – Article 83 (Application Mutatis Mutandis to Appurtenant Nonbuilding Structures) Enforcement Decree of the Building Act – Article 118 (Application Mutatis Mutandis to Appurtenant Nonbuilding Structures) Enforcement Decree of the Building Act – [Attached Table] Appurtenant Nonbuilding Structure Subject to the Construction Report and Permission Enforcement Rule of the Building Act – Article 41-2 (Appurtenant Nonbuilding Structure Construction Permission) Enforcement Rule of the Building Act [Attachment] Application for Appurtenant Nonbuilding Structure Permission
	Nonbuilding structure management ledger not being created even though subjected to the construction report	→ Create a management ledger for nonbuilding structures reported for construction that are included when building permits are granted Clearly mark the nonbuilding structures not subjected to construction reports on the drawings	→ Enforcement Rule of the Building Act – Article 41 (Appurtenant Nonbuilding Structure Construction Report)
	Structural safety inspection being performed prior to construction	→ Submit the structural safety checklist for the nonbuilding structures after being inspected by an expert upon the completion of construction	→
	Responding to new nonbuilding structures according to the changing times	→ Created the types of nonbuilding structures subjected to the construction reports and permits into an attached table of the Presidential Decree	→ Enforcement Decree of the Building Act – [Attached Table] Appurtenant Nonbuilding Structure Subject to the Construction Report and Permission

Life Cycle	Need Improvement	Improvement (Proposed)	Laws Subjected to Amendment and Enactment (Proposed)
Maintenance and Management	No nonbuilding structure maintenance and management inspection system	→ Establish a mandatory nonbuilding structure maintenance and management inspection system	Building Management Act – Article 12-2 (Maintenance and Management Inspection of Appurtenant Nonbuilding Structures)
	Classification of nonbuilding structure inspectors	→ Establish a new inspection system by specialized agencies for nonbuilding structures attached to buildings that are expected to suffer significant damage in the event of an accident	
	Distinguish between the nonbuilding structures attached to a building and standalone nonbuilding structures	→ Establish a new system of inspections by owners and expert inspections every 10 years for others	
	Build a database of inspection results	→ Prepare the inspection reports and register with the information system for the inspections of nonbuilding structures that are conducted simultaneously with the building inspections Reflect the changes during the nonbuilding structure inspections when updating the building management plan	
Dismantle	No nonbuilding structure dismantle system	→ Reflect the nonbuilding structure dismantling plan when preparing the building dismantling plan	Enforcement Rule of the Building Management Act – Article 12 (Preparation of the Dismantling Plan)
		→ Reflect the mandatory dismantling report when dismantling a nonbuilding structure alone	Building Management Act – Article 30-5 (Reporting the Dismantle of Appurtenant Nonbuilding Structures)
	Measures for long-term neglected nonbuilding structures	→ The head of the local government can remove the ex officio if a serious risk to safety can occur	Building Management Act – Article 00 (Removal of Long-Term Neglected Appurtenant Nonbuilding Structures, Etc.) Enforcement Decree of the Building Management Act – Article 00 (Notice of the Ex Officio Removal of Long-Term Neglected Appurtenant Nonbuilding Structures, Etc.)

In the plan to revise the related laws for the systematic management of the nonbuilding structures, the amendment of Article 2 of the Building Act and an addition of Article 3-6 of the Enforcement Decree of the Building Act to define the nonbuilding structures, the amendment of Article 83 of the Building Act and Article 118 of the Enforcement Decree of the Building Act that stipulates the reporting and permit for the construction of the nonbuilding structures, the establishment of an attached table to the Enforcement Decree of the Building Act on the nonbuilding structures subjected to reporting and permit, the amendment to the Enforcement Rule of the Building Act, the amendment to Article 41 of the Enforcement Rule of the Building Act that stipulates the mandatory creation of a nonbuilding structure management ledger for nonbuilding structures constructed within the land, and amendment to Article 41(2) of the Enforcement Rule of the Building Act that stipulates the timing of preparing the structural safety checklist for the appurtenant nonbuilding structure and the preparer are proposed.

In the plan to revise the maintenance and inspection system of the nonbuilding structures, the amendment to Article 2 of the Building Management Act that stipulates the designation of maintenance and inspection targets and appurtenant nonbuilding structure managers, the establishment of a maintenance inspection system for appurtenant nonbuilding structures under the Building Management Act that stipulates the establishment of a new maintenance inspection system for appurtenant nonbuilding structures and the organization of the legal system for fines, and amendments, such as amendments to the Building Act and the Building Management Act to impose penalties and fines for the non-fulfillment of appurtenant nonbuilding structure maintenance obligations are proposed.

In the measures to amend the laws and regulations related to the dismantling of nonbuilding structures and the measures for long-term abandoned nonbuilding structures, the amendment to Article 12 of the Enforcement Rule of the Building Management Act to reflect the nonbuilding structure dismantling plan when dismantling a building, establishing Article 30-5 of the Building Management Act to mandate reporting when only appurtenant nonbuilding structures within the land are dismantled, establishing a system under the Building Management Act to remove long-term abandoned appurtenant nonbuilding structures in order to create a system for measures against long-term abandoned nonbuilding structures are proposed.

Moreover, as there is a need to establish a new institutional system that can manage nonbuilding structures in an integrated and systematic manner, a proposal to enact laws on the construction and management of nonbuilding structures, that includes the establishment of a nonbuilding structure management infrastructure, the construction of the nonbuilding structure, maintenance, management and inspection of the nonbuilding structure, the dismantling and removal of the nonbuilding structure, and supplementary rules and penalties, is also proposed.

## Conclusion

The need to strengthen the management of constructed nonbuilding structures according to their use and location, manage the unreported construction of nonbuilding structures, strengthen the structural safety of nonbuilding structures, and establish and manage a nonbuilding structure database are presented through the analysis of the current status of nonbuilding structures and in consideration of institutional changes, as a result of the study. Through the analysis of the building and nonbuilding structure construction system, introducing a permit and reporting system for the construction of nonbuilding structures, changing the method of creating and managing the nonbuilding structure management ledger, introducing an inspection system for the nonbuilding structure construction completion (approval for use) through improving the structural safety checklist, responding to various types of nonbuilding structures created from social changes, improving the system for the minor activities of nonbuilding structures, and improving the drawing notation method for nonbuilding structures not subjected to construction reports are needed. Through the analysis of the building and nonbuilding structure maintenance and dismantling systems, the need for establishing new maintenance provisions for nonbuilding structures subjected to the construction report, improving the inspection and maintenance system for nonbuilding structures on the same land as the building, improving the inspection and maintenance system for nonbuilding structures that are not located on the same land as the building, and improving the systems for dismantling nonbuilding structures and managing long-term abandoned nonbuilding structures are presented.

Through this, a plan to improve the nonbuilding structure system by considering the life cycle, a direction to improve the nonbuilding structure system as a way to improve the



nonbuilding structure by considering the life cycle, measures to amend the Building Act and subordinate laws for the systematic management of the nonbuilding structures, and a proposal to enact laws regarding the construction and management of the nonbuilding structures are proposed.

The limitations of the study include: difficulty in identifying a clear policy target due to the nature of the nonbuilding structures stipulated in various laws; failure to present an integrated management plan, the opinions of the subjects related to the life cycle of the nonbuilding structures were not sufficiently included as the scope of experts for collecting opinions was not wide; and the search on nonbuilding structures in rural and farming villages, other than cities, were insufficient.

In the future, it is necessary to conduct integrated research on the nonbuilding structure-related systems that are closely related to public safety, establish management and inspection guidelines for nonbuilding structures subject to reporting and permit under the Building Act, and establish structural safety inspection guidelines for each type of nonbuilding structure to check the structural safety of various types of nonbuilding structures.

Keywords : Nonbuilding Structures, Life Cycle, Managing System, Building Act, Building Management Act