

# A STUDY ON THE CLASSIFICATION OF OWNER'S STANDARD SPECIFICATIONS

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**ABSTRACT** : This study suggests how to classify owner's standard specifications in organizations such as local governments which place an order for constructing general and various types of facilities. And the principal conclusions of this study can be summarized as follows; first, the Standard Specifications for Seoul Metropolitan Government of for all facilities could be integrated by seven individual works. Second, it is advisable from a viewpoint of long term to draw up integrally owner's standard specifications by trade for facilities, rather than draw up by group of facilities. Third, editing integrated standard specifications for all trades to meet the unified work classification structure should be backed up by high technology, therefore owner's standard specifications by trades would be favorable to our situation.

*Key words* : *specification, owner's standard specification, classification, work classification structure*

## 1. INTRODUCTION

It is stipulated in Sub-section 2, Number 2 of Section 14 of the enforcement regulations of the Construction Technology Management Law that owner's standard specifications is comprehensive execution criteria to be employed for the execution of specific works or the writing of project specifications, based on standard specifications by facilities and intended for all works. Repeating this, since it is difficult to write out project specifications effectively using 16 kinds of standard specifications published presently, owner's standard specifications is the specifications written out according to comprehensive classification structure by the owner, fitting for the characteristic of its projects, to be employed in performing project effectively and writing out project specifications.

Owner's standard specifications is presently being kept by main public owners and employed for the writing of project specifications. Government-invested enterprises in Korea under Ministry of Construction and Transportation, who have kept and employed owner's standard specifications from long ago, have developed the classification structure of specifications, fitting for the characteristic of their projects, and written out the specifications. However, it is not easy for owners who do not keep owner's standard specifications yet, to decide how to classify and write out the specifications. In particular, there are no cases presently that local governments, except the Seoul Metropolitan Government, ordering projects of various kinds of facilities have written out it's standard specifications.

This thesis presents the methods by which owners like local governments ordering projects of various general facilities write out owner's standard specifications, centering on the classification methods of the specifications.

## 2. CLASSIFICATION CONDITIONS OF DOMESTIC OWNER'S STANDARD SPECIFICATIONS

### 2.1 Classification conditions of owner's standard specifications

The ordered facilities and the composition structures of the specifications of owners who keep owner's standard specifications are shown in Table 1. As shown in Table 1, the name of each owner's standard specifications mostly includes terms representing the kinds of ordered facilities included, such as owner's "Standard Specifications for Housing Projects", "Standard Specifications for Dam and Water Supply Projects" and "Standard Specifications for Expressway Projects". In case of Korea Land Corporation, Korea Agricultural & Rural Infrastructure Corporation, and the Seoul Metropolitan Government, the terms representing general facilities ("Construction Projects"), the terms representing the kinds of projects ("Rural Development Projects"), and the name of owner ("Seoul Metropolitan Government") were used instead of the terms representing the kinds of facilities in the title, because the kinds of ordered facilities included are various for each case.

At present, one name of owner's standard specifications is

**Table 1.** Ordered Facilities and composition Structures of Specifications of Owners

Owners	Ordered Facilities	Name of spec	Classification(Level 1)	Facilities not included
Korea National Housing Corporation	Apartment, Common and public buildings, Welfare facilities and etc.	Standard Specs for Housing Projects	1. General requirements, 2. Reinforced concrete, 3. Architectural, 4. Civil, 5. Mechanical, 6. Electrical, 7. Communication, 8. Landscape	
Korea Land Corporation	Road, Water supply, Sewage, Buildings	Standard Specs for Construction Projects	0. General requirements, 1. Preparation, 2. Earthwork and foundations, 3. Structural, 4. Civil, 5 Waterproof, thermal protection, roofing and curtain wall, 6. Finishes, 7. Electrical, 8. Mechanical, 9. Landscape	Subway, Railway, Filtration plant, Sewage treatment plant
Korea Water Resources Corporation	Dam, Flume, Water supply, and Etc.	Standard Specs for Dam & Water Supply Projects	Civil, Architectural, Mechanical, Electrical, Eletrocommunication, Landscape	Canal, Sewage treatment plant
Korea Highway Corporation	Highway	Standard Specs for Expressway Construction	Civil, Miscellaneous facilities	
Korea Railroad	Railroad	Standard Specs for Railroad Construction	Civil	Other facilities
Ministry of Maritime Affairs & Fisheries	Port, Harbor and Fishing port	Standard Specs for Port, Harbor and Fishing port	1. General requirements, 2. Preparation, 3. Foundation remediation, 4. Earthwork,(Ellipses) 15. Electrical, 16. Landscape	
Korea Agricultural & Rural Infrastructure Corporation	Road, Bridge, Sewage, Sewage treatment plant, Common utilities, Convenient facilities, Waste treatment plant, River, House and Well	Standard Specs for Rural Development Projects	Civil, Mechanical(being prepared), Electrical(being prepared)	Water supply, anchoring and coast facilities
Seoul Metropolitan Government	Various civil facilities, Buildings, Landscape, Incinerators, Wastewater Reclamation & Reusing System and Sewage treatment plant	Seoul Metropolitan Government's Standard Spec	Civil, Architectural, Building mechanical, Building electrical, Building Information & Communication, Landscapes, Plants	Subway, Mechanical and Electrical Works of Civil Facilities

being used for one owner. From the present trend, there are much possibilities that "facilities not included" of Table 1, not included in current owner's standard specifications, will be included in one identical name when the specifications is written out in the future.

As suggested in Table 1, level 1 in the classification structure of owner's standard specifications by owners, except Korea National Housing Corporation and Korea Land Corporation, generally tends to be divided by works, such as civil, architectural, mechanical (equipment), electrical (equipment), and communication (equipment). That is because it has been customary to write out drawing and specification, such as domestic project specifications and cost estimate sheet, by classifying into civil, architectural, mechanical (equipment), electrical (equipment), communication (equipment), etc.

Other owners, except Korea National Housing Corporation, Korea Land Corporation, and Ministry of Maritime Affairs & Fisheries, make classifications by 'volume of civil', 'volume of architectural', 'volume of mechanical (equipment)', 'volume of electrical (equipment)', 'volume of communication (equipment)', etc. without common portions among volumes. And there are few phrases having the function of cross reference among level 1 of the classifications like "volume". This means that arbitrary enactment and revision of any one volume of level 1s of the classification has little effect on other volume of level 1s.

Like the case of Korea National Housing Corporation and Korea Land Corporation, writing out owner's standard specifications by an integrated classification structure having

**Table 2.** Distribution of Project specifications of Seoul Metropolitan Government

Facilities	Civil	Architectural	Mechanical (Buildings)	Electrical	Communication	Landscape <sup>1)</sup>	Mechanical (Plants)
Roads	○			○		○	
Bridges/Elevated roadways	○			○			
Covered structures	○			○		○	
Tunnels	○			○		○	○
Underpasses	○			○			
Drain pipes/Box culverts	○						
Flood pumping stations	○	○		○			
Park facilities/Relics <sup>2)</sup>	○	○		○		○	
Water supply and distribution pipes	○						
Service reservoirs	○			○			
Water collection facilities	○	○					○
Filtration plants	○			○ <sup>3)</sup>			○
Sewage treatment plants	○	○		○ <sup>3)</sup>		△	○
Buildings <sup>4)</sup>	○	○	○	○	○	○	
Subways <sup>5)</sup>	○	○	○	○	○		

Notes

- 1) Facilities for which planting works are made by separate specifications are ones for which planting is ordered separately. For facilities for which planting works are not ordered separately, planting works are included generally in civil or architectural works.
- 2) Park facilities and monuments are not one facility but facilities composed of various ones. In park facilities are included various planting facilities including trees, and generally sculptures of park facilities and monument facilities are included in Building works.
- 3) For filtration plant and sewage treatment plant, the processes of electricity and instrumentation are made by one specifications generally.
- 4) Buildings include Government buildings, welfare halls, hospitals, fire stations, schools, pavilions, memorials, apartments, control offices attached to various tunnels, filtration plant and sewage treatment plant, and control offices, stalls and rest rooms attached to parks, etc.
- 5) For Subway, track and signal works are made respectively, except the presented works.

common portions is bothersome, as suggested in the method 1 of Table 5, and needs professional skills for the writing of owner's standard specifications. Therefore most domestic owners write out and employ owner's standard specifications composed of separate volumes, such as 'volume of civil' and 'volume of building', without common portions for convenience.

In most institutions except Korea Highway Corporation, level 1 of the classifications are generally divided by works, such as civil, architectural, mechanical (equipment), electrical (equipment), and communication (equipment). However, in the case of Korea Highway Corporation, works and facilities are used together in level 1 of the classifications.

**2.2 Classification conditions of the project specifications of local governments**

The results from investigating the classification conditions of several project specifications, which were written out by the Seoul Metropolitan Government from 1990 to 1997 to know the classification forms and conditions of the project specifications of local governments ordering various

facilities, are shown in Table 2.

Facilities for which the number of cases of the writing of project specifications is less than five in total, like the cases of resource recovery facilities and pressurization areas, were not included. It can be known from Table 2 that about 48 kinds of project specifications are being written out by works and facilities. For the case of park facilities and monuments, building works can be excluded from the classification range of owner's standard specifications, since sculptures and monuments corresponding to building works are unique facilities applicable to the project concerned and accordingly owner's standard specifications can not be written out.

It is considered that the kinds of ordered facilities for other local governments are similar to those for the Seoul Metropolitan Government, but there are cases that river facilities are occasionally added. Since it is anticipated recently that orders for environmental facilities like trash incinerating facilities will increase, it is necessary to consider it when classifying owner's standard specifications.

### 3. CLASSIFICATION CONDITIONS OF OWNER'S STANDARD SPECIFICATIONS IN DEVELOPED COUNTRIES

**Table 3.** Distributions of Standard specifications of Developed Countries

Nation	Owers	Name of Specifications	Included works
U.S.A.*	DOT	Various by states	Civil and electrical works
	USACE, NAVFAC	Guide specs and etc.	Civil, architectural, mechanical and electrical works
	Public owners	Spectext (published by CSI <sup>1)</sup> )	Civil, architectural, mechanical and electrical works
		Masterspec (published by AIA)	Architectural, mechanical and electrical works
U.K.	DETR <sup>2)</sup> *	Spec for Highway Works	Civil works
	Public owners**	NBS <sup>3)</sup>	Architectural, mechanical and electrical works
		NES <sup>4)</sup>	Mechanical and electrical works
Germany**	Federal DOT	StLK <sup>5)</sup>	Civil works
		StLK-W <sup>6)</sup>	Civil works
	Public owners	StLB <sup>7)</sup> (published by DIN)	Architectural and mechanical works
Netherla-nds**	Public owners	RAW spec (published by CROW <sup>8)</sup> )	Civil works
		STABU Standard Building Specs (published by STABU)	Architectural, mechanical and electrical works
Switzerl-and**	Public owners	CSD (published by CRB <sup>9)</sup> )	Civil, architectural, mechanical and electrical works
Japan*	Public owners	Common Specs for civil works	Civil works
		Common Specs for architectural works	Architectural works
		Common Specs for mechanical works	Mechanical works
		Common Specs for electrical works	Electrical works

Notes

1) Construction Specifications Institute 2) Department of the Environment, Transport and the Regions 3) National Building Specification 4) National Engineering Specification 5) Catalogue of Standard Works for Highway and Bridge Engineering 6) Catalogue of Standard Works for Civil Engineering Hydraulics 7) The Standard Library of Descriptions of Building Works 8) Center for Research and Contract Standardization in Civil and Traffic Engineering 9) Swiss Research Center for Rationalization in Building and Civil Engineering

\* Koo, Jai Dong, Kim, Tae Song, Kim, Kyun Tae, "A Study on the Improvement of Construction Specifications & Design Criteria (II)", 1999

\*\* International Construction Information Society, "Description and Comparison of National Specification Systems", 1995

As shown in Table 3, owner's standard specifications in developed countries are mostly divided into specifications for civil works and specifications for building works, except some specifications, such as guide specifications of U.S. Army Corps of Engineers (USACE), Spectext of the Construction Specifications Institute of the United States, and Catalog of Standard Descriptions (CSD) of Switzerland. Owner's standard specifications for civil works is mainly for road works by Department of Transportation of each country. As for owner's standard specifications for building works, owners tend to do not make their own owner's standard specifications, and instead employ the specifications written out by professional institutions making specifications of each country, as shown in Table 3. And in owner's standard specifications for building works which are written out by professional institutions making specifications and are generally used by "public owners" of Table 3, most (civil), architectural, mechanical and electrical works are integrated by the classification structure of one integrated works.

### 4. CLASSIFICATION METHODS OF OWNER'S STANDARD SPECIFICATIONS

#### 4.1 Classification improvement methods of owner's standard specifications of the Seoul Metropolitan Government

In the case of owner's standard specifications of the Seoul Metropolitan Government, who first made the specifications as a local government, there are facilities or works that are not included in the specifications at present, but it is considered to be able to be applied like a mark of © of Table 4 according to the classifications of project specifications, suggested in Table 2.

In case of making owner's standard specifications for the part of a mark of ○, which is not applicable to current owner's standard specifications, it is necessary to compare the method that makes the specifications by integrating specifications for various facilities by works with the method

that makes them by dividing the specifications by each facility. If the specifications are made by integrating specifications for various facilities by works, the kinds of owner's standard specifications will be reduced. On the

contrary, if the specifications are made by dividing the specifications by each facility, the kinds of owner's standard specifications will increase. The comparison of these two methods is shown in Table 5.

**Table 4.** Application Scopes of Standard specifications('02) of Seoul Metropolitan Government

Classification of Specs	Civil	Architectural	Building mechanical	Building electrical	Building information & communication	Landscape	Plants
Roads	○			○		○	
Bridges/Elevated roadways	○			○			
Covered structures	○			○		○	
Tunnels	○		○	○		○	
Underpasses	○			○			
Drain pipes/Box culverts	○						
Flood pumping stations	○	○		○			
River	○						
Park facilities/Relics	○	1)		○		○	
Water supply and distribution pipes	○						
Service reservoirs	○			○			
Water collection facilities	○	○	○				
Filtration plants	○			○			○
Sewage treatment plants	○	○		○		○	○
Trash incinerating facilities	○	○		○			○
Buildings	○	○	○	○	○	○	
Subways <sup>2)</sup>	○	○	○	○	○		

1) Parts to which standard specifications do not need to be prepared

2) In subway track and signal works are included specially.

○ Parts which can be applied by present standard specifications

○ Parts which can not be applied by present standard specifications

**Table 5.** Comparison of Classification Methods of Owner's Standard Specifications (Facilities)

Methods	Method 1	Method 2
	Integrating specifications for all facilities by works	Writing by facilities
Examples	All facilities	<ul style="list-style-type: none"> <li>- Roads</li> <li>- Bridges/Elevated roadways</li> <li>- Covered structures</li> <li>- Tunnels</li> <li>- Underpasses</li> <li>- Drain pipes/Box culverts</li> <li>- Flood pumping stations</li> <li>- Rivers</li> <li>- Park facilities/Relics</li> </ul> <ul style="list-style-type: none"> <li>- Water supply and distribution pipes</li> <li>- Service reservoirs</li> <li>- Water collection facilities</li> <li>- Filtration plants</li> <li>- Sewage treatment plants</li> <li>- Trash incinerating facilities</li> <li>- Buildings</li> <li>- Subways</li> </ul>
Merits	- They can keep a standard of specifications by works, and the control of lump enactment and revision for specifications of common works is possible.	- Since owner's standard specifications and project specifications have nearly equal forms, the writing and application of owner's standard specifications are easy.
Demerits	<ul style="list-style-type: none"> <li>- They can have difficulty in writing out specifications applicable to the projects of all facilities.</li> <li>- When writing out project specifications by facilities, they can have trouble in extracting, modifying and editing only parts necessary for the project of appropriate facility from the whole owner's standard specifications.</li> <li>- Since the enactment and revision of owner's standard specifications should be controlled by works by general post, they have difficulty in controlling the enactment and revision.</li> </ul>	<ul style="list-style-type: none"> <li>- Since, in case that the control of the enactment and revision is made by facilities, there are difficulties in writing out unified specifications for common works among specifications by each facility, and the contents of specifications for common works by facilities becomes different, there is a possibility of confusion in use.</li> <li>- In case of keeping owner's standard specifications in binding, keeping the specifications causes inconvenience because the whole quantity of the specifications is vast.</li> </ul>

※ Specifications for classified facilities are written out by dividing works of civil, architectural, mechanical, electrical, communication and etc. again by each facility.

**Table 6.** Improvement Method for Distribution of Standard Specifications of Seoul Metropolitan Government

Works	Civil	Architectural	Building Mechanical	Building Electrical	Building Information & Communication	Landscapes	Plants
Facilities							
All facilities	●	●	●	●	●	●	●

**Table 7.** Comparison of Classification Methods of Owner's Standard Specifications (Works)

	Method 1	Method 2
	Integrating specifications for all works (Integrated Work Distribution System)	Classification by works
Distribution Methods		<ul style="list-style-type: none"> <li>- Civil works</li> <li>- Architectural works</li> <li>- Mechanical works</li> <li>- Electrical works</li> <li>- Communication works (can be included in Electrical works)</li> <li>- Landscape works</li> <li>- Plant works</li> </ul>
Merits	They can keep a standard of specifications for some common works, such as general requirement, foundation works and concrete works, and the control of lump enactment and revision for the specifications is possible.	Since the control of enactment and revision for owner's standard specifications can be made by works, the control of enactment and revision is easy.
Demerits	<ul style="list-style-type: none"> <li>- Under domestic conditions that specifications for civil works and building works are written out differently, there are difficulties in writing out specifications for common works, such as general requirement, foundation works and concrete works.</li> <li>- Since, to ensure connection between common works and different works, the post leading the writing of owner's standard specifications, taking charge of common works in owner, should communicate with the post taking charge of other works, working is bothersome and needs professional skills for writing out specifications.</li> <li>- When writing out project specifications by works, there are difficulties in editing and modifying.</li> </ul>	Since the control of enactment and revision is made by works, specifications for some common works, such as general requirement, foundation works and concrete works, can be different by works.

Even for the parts written out already among owner's standard specifications of the Seoul Metropolitan Government like the part of a mark of © of Table 4, it is necessary to check out whether making owner's standard specifications by the integration by works, according to the method of Table 5, is advantageous or making them by facilities is. That is because it is needed for institutions that have not made owner's standard specifications yet, to make comparison between merits and demerits for the classifications forms of the specifications before they copy the specifications of the Seoul Metropolitan Government. From Table 5, institutions whose skills for making owner's standard specifications are deficient can prefer the method 2 by which the writing and application of the specifications are easy, but institutions having the skills for making the specifications will prefer the method 1 in which the specifications are made by the integration by works. It is considered, taking long views, that to select the method 1

may contribute to the development of the owner's standard specifications of owners.

To integrate owner's standard specifications by works, prerequisite conditions for integration should exist. First, common parts of owner's standard specifications should exist. Second, users (the department of owner managing the project or the contractor) should be the same. If at least one of the two conditions does not be satisfied, there is no reason to integrate specifications, and rather it would be convenient to use them separately. Also, if specifications are bound for integration, but there are no common parts, they can not be considered to be integrated.

By the prerequisite conditions for integration of owner's standard specifications, specifications for all facilities can be integrated by works, for the specifications of the Seoul Metropolitan Government. That is, specifications for all facilities can be integrated by 7 works, such as volume of civil, architectural, mechanical equipment (the title of

"Volume of Building Electrical Equipment" is being used at present, but the term of "Building" should be deleted since the range of facilities should be extended), electrical equipment, information and communication equipment, landscapes, plants. This is represented in Table 6.

Facilities for which quantities of projects are anticipated to increase in the future can be included in appropriate works, judging by the above method, or they can be classified as separate facilities or works.

#### **4.2 Classification methods of owner's standard specifications (Works)**

Examining existing domestic project specifications, the specifications for all facilities tend to be made by dividing into works of civil, architectural, mechanical, electrical, communication, which can be included in Electrical, etc. Since this is a general practice for making project specifications, fixed by construction management practice, relevant law and competent government department, construction industry, task performance structure of owner, etc., it is needed to consider the practice when making the classification structure of owner's standard specifications.

However, in the case of Korea Land Corporation, Korea National Housing Corporation, the Construction Specifications Institute of the United States (Spectext) and the American Institute of Architects (Masterspec), owner's standard specifications by an integrated works classification structure including common works are made.

Comparison between merits and demerits of the method making owner's standard specifications by an integrated works classification structure including common works by facilities and the method making the specifications by dividing into works of civil, architectural, mechanical, electrical, communication and etc. by facilities is shown in Table 7. Since the method making owner's standard specifications according to the method 1 of Table 7, is bothersome and needs professional skills for making specifications, it is difficult to employ it in domestic conditions. Accordingly, it is considered that it is easier to make owner's standard specifications by dividing into works of civil, architectural, mechanical, electrical, communication and etc. by facilities according to the method 2.

### **5. CONCLUSIONS**

The study presented the methods for making owner's standard specifications of owners like local governments ordering general various projects, by analyzing the classification methods of the specifications. The main conclusions of the study are as follows.

(1) As for owner's standard specifications of the Seoul Metropolitan Government, integrating specifications for all the facilities by 7 works is possible.

(2) Taking long views, it is desirable to make owner's standard specifications by integrating specifications for all facilities by works, rather than to make the specifications by dividing specifications by facilities.

(3) Since it is fixed at present to make specifications by dividing into works of civil, architectural, mechanical, electrical and etc., and making specifications by integrating

specifications for all works by an integrated works classification structure needs high-degree professional skills for making specifications, it is favorable to make owner's standard specifications by dividing by works in our current conditions.

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