

A Comparative Study of Housing Performance Grade Indication System of Each Country

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ABSTRACT: Construction projects often end up delivering not-so-pleasant residential environment for occupants unduly in favor of building quality or investment return in forms of schedule reduction, cost saving or quality improvement. To prevent such phenomenon, a globally applicable system to assess and indicate housing performance has been established. To be more specific, a housing performance indicator system is designed to rate housing in terms of noise exposure, environment, landscaping, right of light, energy efficiency and construction materials, etc. to respect customer's right to know by informing prospective homebuyers of its specific performance in advance when housing developers invite prospective customers or advertise subdivision sales. However, as the system is still new to Korea, it seems to have some shortcomings, which deserves attention and improvement.

Therefore, this study is intended to study housing performance indicator systems enforced in major countries around the world including UK, France, Japan and Korea comparatively to propose solutions to issues identified to date.

Keywords: Apartment, Housing performance, Grade indication system

1. INTRODUCTION

1.1 Background and Objectives

Construction projects need to incorporate considerations for novelty in management approach and construction technologies as well as saving cost, reducing the terms of works, risk minimization, quality improvement and industrial safety. However, as all such elements have impact on the implicit ultimate goal of construction contractors are profits, construction projects

often overlook to provide pleasant residential environment for occupants. And as a response to prevent that problem, several countries have developed regulations to assess and indicate housing performance.

HPGIS (Housing performance grade indication system) was made to rate housing performance in terms of noise exposure, environment, landscaping, right of light, energy efficiency and construction materials and etc. This is to respect customer's right to know and ensure quality improvement of

apartment housing by informing prospective homebuyers of its specific performance in advance when housing developers invite prospective customers or advertise subdivision sales. However, the system enforced on January 9, 2006, so Korea has caused a lot of confusion within the construction industry, as the enforcement was rather premature with insufficient advance preparation, prior to development of environment-friendly products or quality improvement technologies. In addition, as the system aimed to assess housing performance in design phase, several shortcomings such as guaranteeing housing performance grade due to constraints in assuring compliance with performance requirements relating to inter-floor noise, for example.

In terms of research trends in Korea, Jeong, Jin-Seong (2007) studied the comparison of Japan and Korea on system because the Japanese one was most similar to the Korean. However, it still needs to survey similar systems in other countries because this study is limited in Japanese's. Kim, Soo-Am (2007) studied the systems in Japan, France and Korea but it simply went as far as introducing the systems, making supplementary research inevitable.

Therefore, this study is intended to study housing performance indicator systems enforced in major countries around the world including UK, France, Japan and Korea comparatively to propose solutions to issues identified to date.

1.2 Scope and Method of the Study

This study is limited its scope to apartment housing and examine the HPGIS enforced in France, Japan, UK, USA and Korea comparatively. Following is the research process:

- 1) Collect a study literatures on "HPGIS" in Korea and investigate housing consumer damages in Korea.

- 2) Study literatures about systems relating to housing in UK, France and Japan.

- 3) Analyze HPGIS across countries comparatively and propose improvements to HPGIS of Korea.

2. THEORETICAL STUDY

2.1 Research Status

Park, Shin-Young (Korea National Housing Corporation, 1998) reviewed whether Korea was ready for enforcement of housing performance warranty system in developed countries. Jang, Sung-Soo (Korea Housing Institute, 2000) examined the status of housing construction industry in Korea and studied home warranty system in major countries in search of housing quality warranty system aligned towards specific needs of Korea. A joint study by the Ministry of Land, Transport & Maritime Affairs and Issue Engineering & Construction Co., Ltd. (2007) explained HPGIS, summarized details relating to the 5 factors, the 14 categories and the 20 items of the system and analyzed cases of material use in relation to rating and issues thereto. Jeong, Jin-Sung (2007) studied trends relating to housing performance assessment systems in Korea, the US, Europe and Japan. However, as the Korean system benchmarked the Japanese, he analyzed the systems in two countries comparatively on judgment that the Japanese one was the most similar certification system to the Korean. Kim, Soo-Am (2007) examined the HPGIS of Korea and introduced it in comparative terms with the Japanese and the French equivalents.

Preceding studies to date indicate that it has not been long since the enforcement of HPGIS in Korea. As a result, there have been just a few studies on the subject and many of them focused on the Japanese system. Therefore, this study is intended to fill the gap in preceding studies, examine equivalents in the UK, and France different in forms to the Korean system and compare assessment items incorporated in the systems of Korea, the UK, France and Japan.

2.2 Housing Consumer Damages in Korea

Prior to studying systems relating to housing of each country comparatively, current status of consumer damages in Korea is examined first. According to “Apartment Housing Buyer Damage Survey” by the Korea Consumer Agency, 399 consumer grievances relating to housing were reported from 2003 to June 30, 2005 with 162 in 2003, 162 in 2004 and 75 in the 1st half of 2005. Among the 399 cases reported, apartment (85%) accounted for most of the housing consumer grievances, followed by tenement/multi-family houses (25 or 6.3%) and houses (10 or 2.5%).

Table I: Consumer Grievances by Housing Type.

Year	Apartment	Tenement-Multi-Family	House	Others	Total
2003	135 (83.3)	12 (7.4)	6 (3.7)	9 (5.6)	162 (100.0)
2004	134 (82.7)	12 (7.4)	3 (1.9)	13 (8.0)	162 (100.0)
Jun 30, '05	70 (93.3)	1 (1.3)	1 (1.3)	3 (4.0)	75 (100.0)
Total	339 (85.0)	25 (6.3)	10 (2.5)	25 (6.2)	399 (100.0)

339 grievances filed in relation to apartment are broken down to construction defects, environmental defects and title defects in general. Among all the cases reported, construction defects relating to structures, construction facilities or finishing materials account for more than majority 175 cases(51.6%), as environmental defects such as noise and odor accounted for 16 cases(4.7%) and right's defects relating to subdivision sales and tariff charges amounted to 128 cases(37.8%).

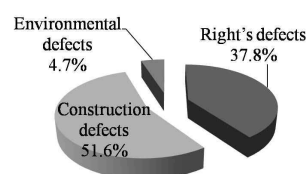


Figure 1: Consumer Grievances by Defect Type

In other words, apartments account for the largest share of consumer grievance filings relating to housing and construction defects and environmental defects that HPGIS incorporates as performance items are the sources of 181 cases or 56.3% of such grievances.

As such, it is now found that apartments are involved in many housing consumer damages in Korea and many of such damages are related to housing performance in terms of structure, finishing material, construction facility, noise and odor, etc. Therefore, the HPGIS of Korea needs to be improved and enhanced as early as possible to prevent such damages in advance.

3. SYSTEMS OF EACH COUNTRY RELATING TO HOUSING

3.1 Korea

On January 9, 2006, Korea enforced HPGIS (Housing performance grade indication system) that would rate each of 20 items in 14 categories under 5 factors including noise, structure, environment, living conditions and fire control.

Parties to the housing performance grade indication system of Korea include operating and supervising authority (Residential Environment Department, the Ministry of Land, Transport & Maritime Affairs), applicant and indication authority. When an applicant prepares and submits application (including self-assessment report and drawings and etc.) to indication authority, the indication authority reviews submission package, issues performance grade indication statement and notifies the

applicant of indication results. Then, the rating authority maintains performance indication records, prepares specific operating guidelines and applicant discloses indication results in advertisement for occupants. In the meantime, the operating and supervising authority operates HPGIS, designates and maintains indication authority. The whole framework is as shown in Fig.2.

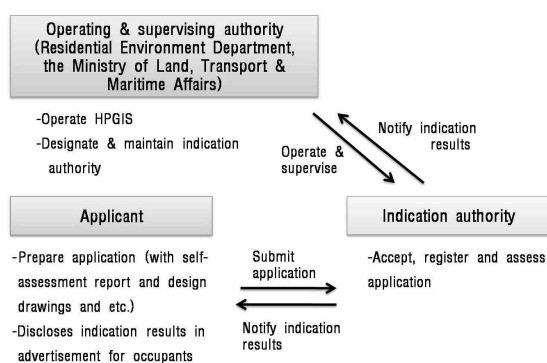


Figure 2: Operating Framework of HPGIS in Korea

The indication process of HPGIS is as shown in Fig.3. First, applicant must submit necessary documents including application for performance grade indication, self-housing performance grade assessment report and other attachments as necessary to indication authority that must issue performance grade indication statement in 20 days from acceptance of application and may extend such time period up to 10 days if inevitable. If some documents are found to be missing or inadequate, indication authority may require applicant to revisit and submit such documents.

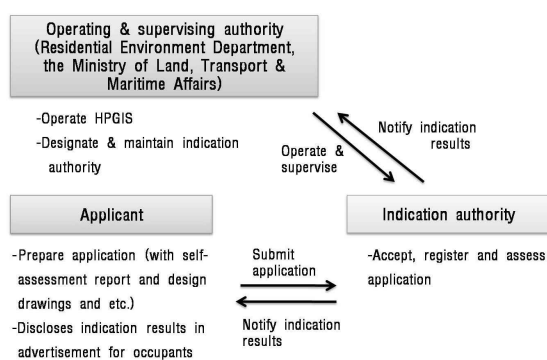


Figure 3: Indication Process of HPGIS in Korea

3.2 UK

DEGW of UK enforced HQI (Housing Quality Indicators) system in 1996 as a tool to assess the performance of new or existing residential structures. The HQI system assesses structures in terms of 10 items under 3 factors including Location, Design (Site, Unit), External Environment online or offline. During the indication process, RSL(Registered Social Landlords) or developer fills out HQI form and registered assessors prepare scoring spreadsheet. Each question is weighted in relation to its significance. The indication process is as shown in Fig.4.

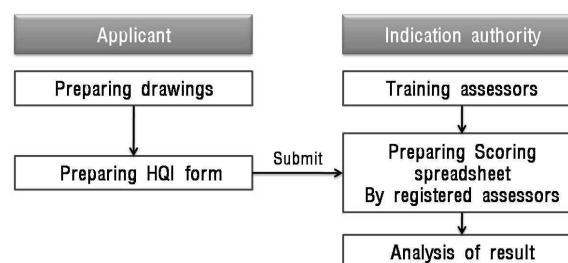


Figure 4: HQI System of UK

3.3 France

In France, the Qualitel Association enforced Qualitel Label system for design drawing, contract document, advertisement, catalogue and housing on January 10, 1978. Housing performance assessment items of the system involves 26 items including sanitary piping, electrical facility, interior noise proofing, exterior noise proofing, summer air conditioning, exterior/roof maintenance cost, heating/hot water charges under 7 categories. Applicant prepares and submits design drawings to registered housing performance assessment authority. Assessment is conducted in two categories, design assessment which is mandatory and adequacy assessment (construction assessment) which is optional. Design assessment is consisted of preliminary assessment on feasibility and compliance of housing with prescribed standards and final

assessment on contract documents. Feedback from preliminary assessment must be incorporated in construction design for improvement. The indication process is as shown in Fig.5.

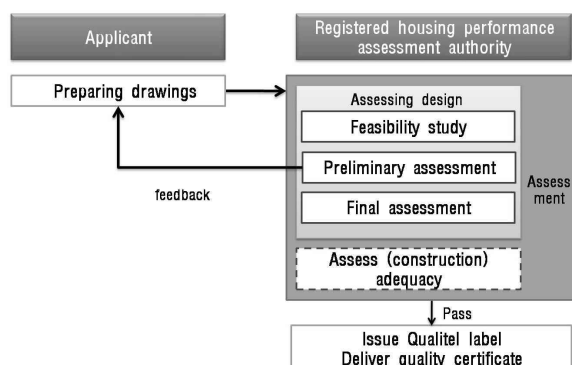


Figure 4: Qualitel Label System of France

3.4 Japan

Japan enforced housing performance grade indication system on April 1, 2000 and put it in operation in October of the same year. Performance grade items involve 29 items including structural integrity, fire safety, deterioration resistance, considerations for maintenance, heating environment, air environment, light/sight environment, sound environment, considerations for the elderly, deterioration status inspection and etc, under 10 categories. The grade indication system is applicable not only to new housings but also existing ones as well.

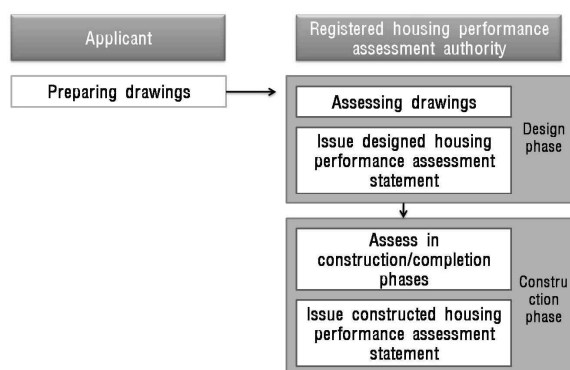


Figure 4: Housing Performance Grade System of Japan

4. COMPARATIVE ANALYSIS OF SYSTEMS OF EACH COUNTRY RELATING TO HOUSING

Housing performance assessment systems in Korea, UK, France and Japan were government initiatives. Among them, only Korea has enforced it as a mandatory system while others maintain them as optional. Table 2 below contains comparison among different systems across countries.

Table II: System Features in Korea, UK, France and Japan

Section	Features
Korea	- Mandatory system applicable to new housings - Deriving its basis from the Housing act but closer to private sector initiative in substance - Assessing housing performance in design phase - Focusing on adaptability of structure and ease of maintenance for structure service life
UK	- Optional system applicable to both new and existing housings - Assign weights to each assessment item - Assess in feasibility study phase - Focus on design
France	- Optional system applicable to new housings - Design assessment is mandatory but construction assessment is optional - Focus on items relating to facilities

Japan	- Optional system applicable to both new and existing housings
	- Assess in 2 phases, design phase and on-site inspection following completion
	- Focus on structural integrity items such as resistance against earthquake, flood storm and snowdrifts

Korea and France limit the system scope to assessment of new housing while UK and Japan include not only new housings but also existing ones.

Korea and UK assess performance grade in design phase and feasibility study phase respectively while France enforces only design phase assessment as mandatory and leaves construction adequacy assessment as optional. On the other hand, Japan indicates performance grades in 2 phases, design phase and on-site inspection phase following completion to indicate housing performance both before and after construction.

Table 3 below contains comparison in detail of assessment items of each country on the basis of system features of Korea, UK, France and Japan as above.

Table III: System Features in Korea, UK, France and Japan

Section	Korea	UK	France	Japan
Noise	○	○	○	○
Structure	○	○		○
Landscaping	○	○		
Right of Light	○	○		○
Interior Air Quality	○			○
Thermal Climate	○	○	○	○
Fire Control	○			○
Nearby Facilities	○	○		

Design Performance for the Under-privileged	○	○	○
Parking Facility		○	
Mobility		○	
Unit Shape		○	
Floor Plan within Unit		○	
Location		○	
Visual Features		○	
View		○	
Unit Space		○	
Facilities			○ ○

Korea focuses on adaptability of structure and ease of maintenance in favor of structure service life and excludes items relating to design and facilities from the assessment. On the other hand, UK incorporates such assessment items as common to several other countries, yet, places significant gravity on design elements and excludes items relating to facilities from the assessment. France focuses significantly on items relating to such facilities as sanitary pipe and electrical installations, but, leaves a lot for further enhancement on the other items. Japan underscores structural integrity grades in relation to resistance against earthquake, flood storm and snowdrifts, but, design items from the assessment.

And in UK, assessors assess housing performance by means of spreadsheet containing questions on assessment items assigned with different weights respectively. And the system is improved iteratively in reference to feedback from additional studies and HQI (ver.4), new design and quality standard of housing corporations, was issued in April, 2007.

5. CONCLUSION

Construction defects including water leakage, dew condensation and crack as well as environmental defects such as defects in sanitary facilities, water supply/discharge installations, finishing materials and noise or odor account for 51.6% collectively, indicating significant distrust of consumers in apartment housing quality and performance. In response, Korea introduced HPGIS in 2006 to build a platform toward adoption of housing quality warranty system.

1) Indication processes and assessment items of each country relating to housing performance assessment have been analyzed comparatively herein to provide basic inputs to subsequent studies on potential improvements to the Korean system.

2) Comparative analysis across different countries has indicated that unlike others, Korea enforces HPGIS as mandatory, limits its scope to new housings and performs assessment only in design phase.

3) It is found that Korea focuses on structure service life, UK on design, France on facilities and Japan on structural integrity in relation to performance assessment items.

Therefore, HPGIS of Korea needs improvements in terms of its scope and applicable phase on the basis of understanding of geographical and cultural differences and drivers differentiating gravity on various assessment items across countries.

This research needs to be understood as a precursor to subsequent researches on exploring directions of improvement to help HPGIS be firmly established in Korea.

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