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The Design Elements for the Model Development of New-Hanok Type Service Facilities in Apartment Housing

- Focused on the Genetic factors of Korean Traditional Architecture-

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ABSTRACT

Purpose: This study is as only basic research for the model Development of the New-Hanok Type Service Facilities in Apartment Housing, which is as a decisive factor used as a planning element for developing the model inherited tradition, There aimed at extracting the genetic factor of Korea's traditional architecture. **Method:** For this purpose, Consider the concept and regulations of the New-Hanok Type Service Facilities in Apartment Housing and examined the Domestic Application Status of the New-Hanok Type Service Facilities in Apartment Housing. It sets direction of the New-Hanok Type models development based on Expert advice and the literature, and was reviewed a primal reason system of Korea as an extraction base of genetic factors. **Result:** Then Through the framework of the vertical axis (the form), the horizontal axis (space), It extracted the genetic factors of the Korea Traditional Architecture, classified the genetic factors extracted as the structure(layout, construction, space), features, traditional beauty, investigated the content of the form representation and spatial meaning, and were characterized. Based on the result, It were comprehensive the genetic factors extracted as plan Elements for inheriting of the traditions.

KEYWORD

New-Hanok Type,
Service Facilities,
Genetic factors of Korean Traditional Architecture

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1. Introduction

1.1. Research objectives

The government is preparing systematic basis for distribution and expansion of Hankok which is high quality and eco-firnedly housing based on new hanok plan for national status improvement confirmed by the third national architect policy planning committee('10.05.03). Especially to accomplish '2020 hanok Renaissance, hanok popularization era' which is the propulsion goal of new hanok plan, development, expansion and distribution of various architectural space through utilization and close relation with modern and traditional architect are needed.

This research pursues popularization through opportunity expansion of new space experience to locals and future residents by developing public building models in new hanok type utilizing, connecting various planning factors of traditional and modern architect with service facilities[1)] within apartment housing mutually. But succession problem of traditional architect can be said to be the factor that should be considered the first in the process of developing service facilities to new hanok. This research intends to extract genetic factors of Korean traditional architect as a decisive factor that enables utilization based on plan for traditional succession upon model development of service facilities of new hanok Type.

1.2. Research method

We set the category and basic concept of service facilities of new hanok Type examining system and current relevant regulations and extracted genetic factors of Korean traditional architect as planning factors for tradition succession and developmental direction of model based on analysis result such as literature study, field survey and expert consultation as well as investigation on application status of new hanok Type service facilities.[2)]

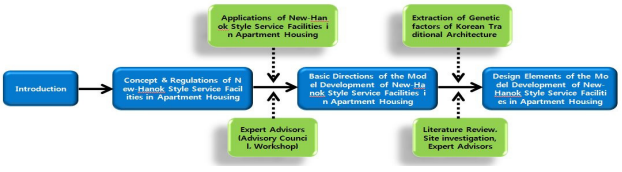

Fig. 1. Research Progress Pictures

1) In the future this study indicated only 'Service Facilities' to omit 'within apartment housing' of the 'Service Facilities within Apartment housing'

2) Among planning factors for model development of new-hanok service facilities, research result in hanok technology development in 1st stage and planning factors that will be drawn in modern building techniques were excluded in this research.

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2. Analysis of related regulations and concept of new hanok service facilities

2.1. Concept and category

(1) Scope and definition of hanok clarified in legal system

National regulations[3] and ordinance of local governments define hanok[4] commonly mentioning 'Korean roof tile' and 'wooden structure' and 'traditional beauty' is stipulated as the following important standard. ‘Natural material’ is partly mentioned as well and in case of ordinance in Jeonju(’02), it stipulates not only the gate which is the landscape element but also walls. Currently, it was shown that only buildings with unified structure, material, traditional beauty are set as the scope of hanok in national regulation and ordinance.

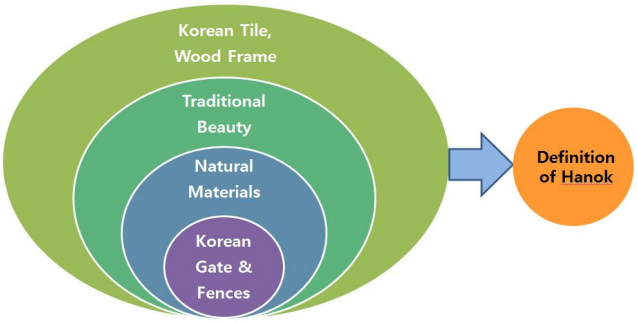


Fig. 2. The Definition of Hanok In the National Legislation & Bylaw

(2) Concept and category of new hanok Type buildings

The scope of new hanok Type building defined in this research is the wider concept differentiated from ‘new hanok’[5] that is gaining its importance and is the flexible one that can expand 'new hanok' with main objective on house securing to various buildings such as public buildings and can be said to belong to ‘building asset’[6]and ‘hanok building form’[7] stipulated in current regulations.

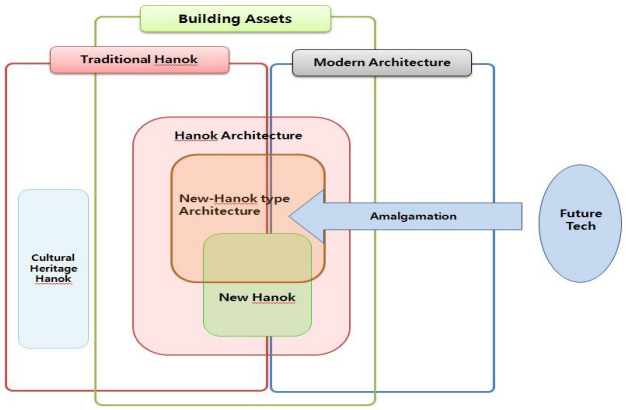
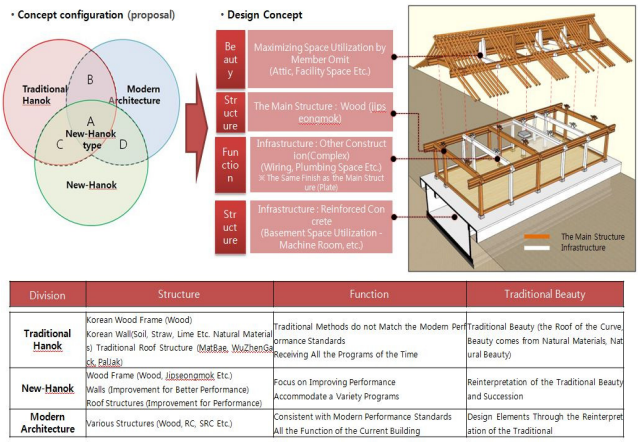


Fig. 3. The Category of New Hanok Type Architecture



Division	Structure	Function	Traditional Beauty
Traditional Hanok	Korean Wood Frame (Wood) Korean Wall(Soil, Straw, Lime Etc. Natural Materials) Traditional Roof Structure (MatBae, WuZhenGack, Paljak)	Traditional Methods do not Match the Modern Performance Standards Receiving All the Programs of the Time	Traditional Beauty (the Roof of the Curve, Beauty comes from Natural Materials, Natural Beauty)
New-Hanok	Wood Frame (Wood, Jipseongmok Etc.) Walls (Improvement for Better Performance) Roof Structures (Improvement for Performance)	Focus on Improving Performance Accommodate a Variety Programs	Reinterpretation of the Traditional Beauty and Succession
Modern Architecture	Various Structures (Wood, RC, SRC Etc.)	Consistent with Modern Performance Standards All the Function of the Current Building	Design Elements Through the Reinterpretation of the Traditional

Fig. 4. The configuration concept of New-hanok type building

The concept of ‘new hanok Type building’ is based on structure, function and beauty as well as possible transformation and recreation of planning factors drawn in modern building techniques and research result of 1st step hanok technology development along with genetic factors drawn from traditional architect responding to new environment that pursues continuous change and sets the direction that actively accepts modern conveniency, efficiency as standards based on the structure, function, traditional beauty of hanok[8].

(3) The concept and scope of service facilities of new hanok Type

New-hanok service facilities are buildings with structural, technological, design features of new hanok[9] and limited to annex (management office), welfare facilities (senior citizen center, kindergarten, resident's common space) within apartment housing.

3) National regulations that defines hanok are stipulated in hanok experience business(’10.02.24), article 2 in enforcement ordinance of tourism promotion act and article 2 of building act enforcement ordinance. (’10.02.18)

4) "Hanok" refers to the structure with Korean roof frame and is a wooden structure in its pillars and buildings that reflect Korean traditional forms finished with natural materials such as Korean roof tile, chaff, wood, soil and its annex. Article 2 of enforcement ordinance of building act, Ministry of Land, Infrastructure and Transportation, [Enforced on 2010.02.18.]

5) The concept of ‘new hanok’ is established through old law grafted with new technology succeeding traditionality and is the one that commonly calls Korean buildings improved or built currently with internal spae accpeting modern people's lives. ‘Plan research on supply of Korean style public buildings’, AURI, 2011

6) “Building asset” has social, economic, scenic value valid in present and future or refers to the buildings that contributes to formation of identity of region and welfare of building cultures of the nation or possessing historical and cultural value that is unique such as hanok. Law on promotion of building asset such as hanok(Law no. 12729, enacted on 2014.6.3.) [enforced in 2015.6.4], Ministry of Land, Infrastructure and Transportation

7) “Korean Building Style" is built using modern material and technology or has forms and structure of hanok. Same legislation with footnote 4).

8) Hanok used in this research not only refers to traditional house building (house) but structure with wooden structure with pillars defined in Article 2 of enforcement act of building law」 and the whole annex and building that reflect Korean traditional style finished with natural materials such as Korean roof tile, chaff, wood and soil.

9) New hanok style building in this research not only refers to buildings but also includes every space at outside, transfer space, inside.

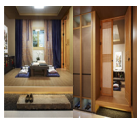
Table 1. Service Facilities Installation Standards According to the Current Number of Households of Housing Construction Standard

Division		Small scale			Medium Size		Large scale
		50Generation	100Generation	300Generation	500Generation	1000Generation	2000Generation
Facilities	Management Office	○	○	○	○	○	○
	Rest facilities			○	○	○	○
Welfare facilities	Children's playground	○	○	○	○	○	○
	Resident sports facilities				○	○	○
	Homes for the elderly		○	○	○	○	○
	Nurseries			○	○	○	○
	Residents communal facilities			○	○	○	○
	Small library			○	○	○	○
	Kindergarten						○
	Neighborhood Facilities	Households×6㎡					

2.2. Investigation on application status

In recent new house complex, differentiated marketing strategy as design grafted with Hanok is gaining importance as a new trend. But the case where welfare service facilities are created as hanok style is very scarce. But the case applied to the country recently includes 'Raemian Mapo Riverwell' complex in Seoul that started a sale since Junly of 2014 and it was understood that planning factors of traditional hanok such as living room and yard were introduced in residential common place in 'Kyunghui palace Xai' in Jong-no, Seoul and 'Woopyung Labien' in Andong of Kyungbuk which are for sale now. Application status of Table 2 is the survey result through experts consultation on field visit and related organization and phone survey of local governments office, internal search.

Table 2. Application of Hanok in Apartment Housing

Classification	Instance			
Service Facilities	Seoul 'Raemian Ma-po River -well '	Start moving in July 2014 (563menage)		creating the Hanok type park and children's playground, guest house, tea house in Hanok
	An-dong 'woo-pyeong Ravi-yen'	Starting pre-sale from the end of February 2015 (230menage)		introducing the Hanok traditional beauty in the Facade, roof garden, yard, rest area
	Jong-no 'Gyeonghuigung Xi'	Pre-sale December 2014 (2533menage)		Introducing Korean "yard" and "floor" in the apartment doorway
Planar structure	Mok-po 'Umi Fahrenheit'	The end of 2011 pre-sale (548menage)		Introducing Sarang-chae and veranda followed from the entrance immediately
	Gyeong-gi, 'Pyeongtaek vision Prugio '	Pre-sale schedule in 2015 (761menage)		Introducing Sarang-chae to the plane

2.3. Review on related regulations

Followings are summary of examined, limited range of welfare facilities that are senior citizen center, kindergarten, residential common space (playground for children, small library, gymnasium, kindergarten) and annex that is management office.

Table 3. Installation Scale of the Population Communal Facilities in Apartment Complexes of the Target Total Area Method

Installation Scale of the Population Communal Facilities in Apartment Complexes of the Target Total Area Method							
Division	Applicable legislation	Installation Scale in Accordance with Installation Standards				Note	
The Population Communal Facilities	"Regulations on housing construction standards." Article 55, Section 2 Population Communal Facilities	Households	The total area of the court		An Adjustable Total Area in the Regulations	The total area of the court	An Adjustable Total Area in the regulations
		100 generations Less than 1,000 menage	Area of plus 2.5 square meters per menage	2.5㎡ × menage	1.875㎡ × menage	2.5㎡ × (100 ~ 1000 menage) = 250㎡ ~ 2,500㎡	1.875㎡ × (100 ~ 1000 menage) = 187.5㎡ ~ 1,875㎡
					3.125㎡ × menage		3.125㎡ × (100 ~ 1000 menage) = 312.5㎡ ~ 3,125㎡
		More than 1,000 menage	Area of plus 2 square meters per menage in the500 ㎡	500㎡+ (2㎡× 세대수)	375㎡ + (1.5㎡ × number of menage)	500㎡ + (2㎡ × 1,000 menage) = 2,500㎡	375㎡ + (1.5㎡ × number of menage) = 1,875㎡
					625㎡ + (2.5㎡ × number of menage)		625㎡ + (2.5㎡ × number of menage) = 3,125㎡
		Being calculated as the sum of the area for each area that are dedicated facilities However, if the facilities are installed outdoors, the land area is estimated to be a facility setting.					
		*Necessary to identify the competent authorities Ordinance of the business Land					

Table 4. Minimum Area Criteria of the Population Communal Facilities in Apartment Complexes of the Target Total Area Method

The minimum area under the facility					
Division	Applicable legislation	Minimum Area Criteria			Note
Management Office	"Regulations on housing construction standards." Article 28	More than 50 menage	More than 10 ㎡ plus 500㎡ Every menage over 50 menage in the area	10㎡ + (menage-50 menage) x0.05㎡	However, if The sum of the area exceeds 100㎡ It may be to 100㎡ the area of the installation Located on the basis of efficiency of administration and accessibility of the residents
Homes for the elderly	"Regulation on residential construction standards." Chapter 2, Article 55 Article 5 and Article 6	More than 150 menage	Area plus 0.1㎡ to 50㎡ per menage	50㎡ + (0.1㎡ × number of menage)	Sunshine, natural lightings/ entertainment, hobbies, multi-purpose room / gender space available/water, cooking, and toilet and garden accessory installation
	"Elderly Welfare Law" Article 36 "Old man welfare Enforcement Rules" Article 26	More than 150 menage	More than 20 people using personnel (in the case of Eup and Myeon , the 10 or more)		Elderly are autonomously Friendship, hobbies, co-workshop operation and various information exchange, the purpose of providing a place to allow the other recreational facilities
		Facilities Criteria	1 toilet, 1 living room or foyer, electrical facilities 1		
		Equipment standards	Living room or foyer: more than 20 ㎡		
Nurseries	"Regulation on residential construction standards." Chapter 2, Article 55 Article 5 and Article 6	300 to less than 600 menage	0.1 persons per menage people		
		Less than 600 to 1,000 menage	Persons of 30 + 0.05 persons per menage		
		More than 1,000 menage	Area to care for 80 or more people		
	"Infant Care Act"	Facilities area include nursery	More than 4.29 ㎡per 1 Infants (excluding playground area)		Installing the kitchen, bathroom, toilet, playground equipment
		Nursery area	More than 2.64 square meters per 1 infants including Living room, crawling room and game room		
Children's playground	"Regulation on residential construction standards." Chapter 2, Article 55 Article 5 and Article 6	Less than 150 to 300 menage	Install the appropriate area be harmonized with landscaping, greenery Taking into account the local conditions, the apartment complex features		* Note: Residential complex of installing to integrate The sports facilities, landscaping, and greenery, recognizing children's playground footprint in accordance with the business plan approver is recognition
		Less than 300-1000 menage	Area plus the per menage 1㎡ to 200㎡		
		More than 1,000 menage	Area plus the per menage 0.7㎡ to 500㎡		
	"Infant Care Act Enforcement Rules"	Nurseries Nursery garden more than 50 people	principles of 3.5 square meters or more (outdoor playground) per Infants		However, the Minister of Health and Welfare can be installed in accordance with the criteria a playground to determine the basis of the area and maximum number of infants to participate in fun activities in the same time zone as daycare centers, depending on size (people),
Small library	"Regulation on residential construction standards." Chapter 2, Article 55 Article 5 and Article 6	"Libraries Act command" area in accordance with the criteria of Annex 1	Note: Ministry of Culture and Tourism recommends an area of around 100㎡ to the proper functioning of a small library		-Note: the building area of the entrance, foyer, hallways, restrooms and dining room area shall be included
	"Library Law Decree"		Building area of over 33 square meters, view seats of 6 seats or more, more than 1,000 book library materials		

The minimum area under the facility				
Division	Applicable legislation	Minimum Area Criteria		Note
Resident sports facilities	"Decree of the Act on the installation and use of athletic facilities."		To determine the physical facilities, the area in accordance with the standards of the stadium each event group game	
Kindergarten	"Regulations on Housing construction standards." Article 52	2000 generations	Section 2 For facilities with a composite construction of kindergarten for any purpose other than -> it can be installed with only (limited to facilities that can be installed on the school environment hygienic cleansing areas of the "School Act"), Medical facilities, resident sports facilities, child care facilities, religious venue, neighborhood living facility. The total area of the bottom of the case to be less than K-use one-half of that building floor area. <Amended 30/06/2005, 08/12/2011>	Construct To installation who wish of the facility to pre-sale by securing the land for housing development or supply to those who want to operate it by building a kindergarten (except exclusions)
			The complex architecture by the provisions of paragraph 2 should be in a separate structure with facilities of other purposes(excluding the day care center and social welfare) entrance, stairs, hallway and bathroom of Kindergarten to protect the environment of child care. <Amended 08/12/2011>	

3. Induction of planning factors and basic direction of model development

3.1. Basic direction

The basic principle of model development of new hanok style welfare facilities is improvement of improper parts to modern architect environment and succession of advantages of traditional architect. Thus as it is organically connected to sustainable settlement environment of past, present and future, it pursues a high fusibility as potential capacity that can create new demand actively dealing with changes in demand regarding various housing life of demanders.

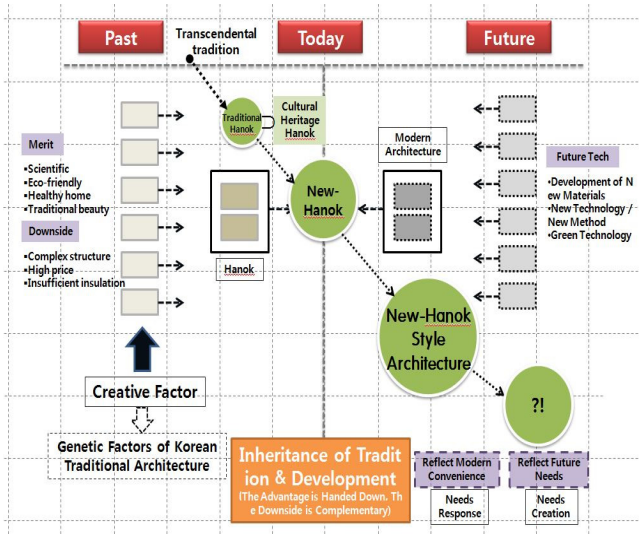


Fig. 5. Basic Directions of the Model Development of New-Hanok Style Architecture

3.2. Planning factors deduction: Genetic factors of Korean traditional architect[10)]

(1) Deduction basis

Analysis regarding genetic factors starts in the aspect that ideological reason of Korea tradition is the basis that forms the distinction of Korean traditional architect. Although there is a difference between ages and implementation method as a space modeling principle hid in the backside of factors that do not change in Korean space culture, 'Heaven unity' thought that means sky (天), land (地) and people (人) unite can be considered as the root idea of our people. [11)]

Our ancestors stipulated land(人, buildings) as ‘man's world’, and heaven(天) and underground(地) that cannot be explained with daily experience of human as ‘god's world’ and recognized buildings(+) as 'vertical(丨) • horizontal(一) axis' that connects heaven(風) and land(水)[12)] Likewise, Korean traditional architect seriated the nature connecting internal and outer space efficiently using natural energy through its ‘風流(wind road)’ in empty space between buildings. This leads to taste(風流)→flow of wind, water. light→geometric geography(風水地理)→natural providence. Korean traditional architect involves ideological concept of ‘Natural(天地人) unity’ forming basic frame of space creation method thanks to ‘aesthetics of nature’.

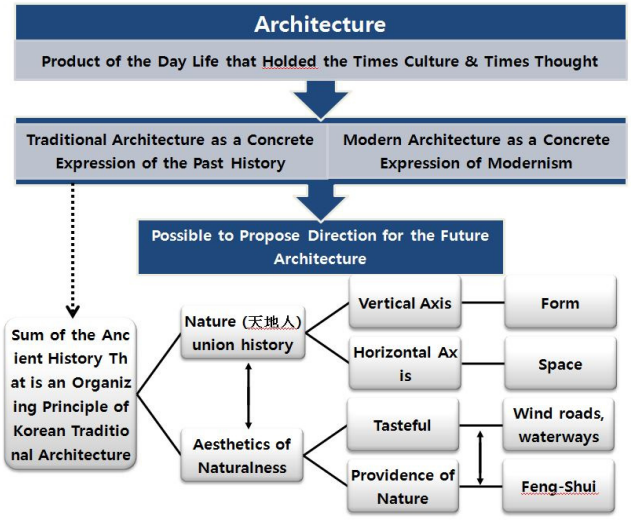


Fig. 6. Korea Unique spirit As an Organizing Principle of Korean Traditional Architecture

10) For methods for genetic factor extraction, this research is based on empirical experience, theoretical contemplation as well as independent decision of research faculty and opinion acceptance. Thus genetic factors possess their meanings and values as planning factors with variable features rather than fixed ones.

11) Heaven unity ideology is the main point of 「Chunbukyung(天符經)」 which is the history of ideology that becomes the root of Korean people, and Chiwon Choi who translated 「Chunbukyung」 into Chinese characters clarifies that his is the ‘taste(風流)’ which is the religion or our people root in 「Nanrangbisu(鸞郎碑序)」.

12) Bae, Kang-won and others, A Study on the Korean Archetype Space of the Mythology Based on the Eliade's Mythic Geography, Journal of 25 No. 4, 2012, pp.101-113

(2) Scope and method of genetic factors extraction[13)]

Since there is a close relation between outer and inner space in Korean traditional architect, the scope of genetic factors extraction included overall features such as internal space, transfer space, outer space. The target of genetic factors extraction was limited to Korean traditional architect in Chosun era.[14)] Representative instance of extracted genetic factors utilized field image data collected in direct survey in most cases along with literature investigation.

Based on primitive idea of Korea, following figure shows the composition organized after examining genetic factors extracted through vertical (form), horizontal (space) analysis with structure, function and beauty.

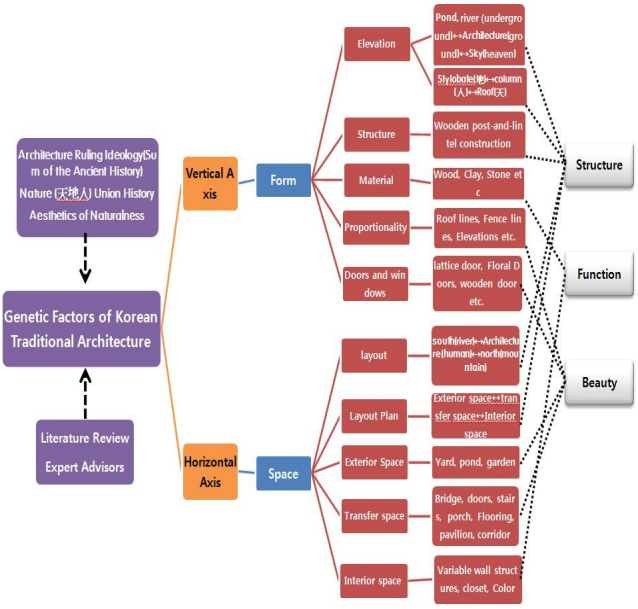


Fig. 7. Configuration of Extraction Method of Genetic Factors

The procedure and method of genetic factor extraction contemplates Korean primitive speculation system regarding nature(heaven) unity ideology through first, literature review. Second, genetic factors were extracted through vertical (form), horizontal (space) analysis regarding various cases of traditional architect space and reviewed objectively through domestic experts consultation and independent decision of research faculty. Third, extracted genetic factors were classified into structure (allocation, design, space, function and traditional beauty to help analysis of features and contemplation of contents in accordance with spatial meaning and formative expression. Fourth, deduced genetic factors were combined as planning factors for tradition succession.

13) The genetic factors extracted in this research have their meanings in basic work for excavation of traditional factors that can be utilized upon model development of new-hanok styled public buildings in the future. Thus other traditional factors not utilized in this research as well can be utilized upon future model development.

14) Although buildings were created prior to Chosun era, most of them were recreated in late Chosun era so we included every traditional buildings that exist now in targets.

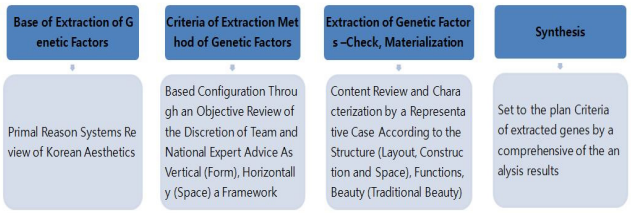
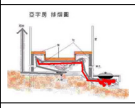
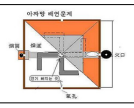


Fig. 8. Extraction Methods and Procedures of Genetic Factors

(3) Genetic factors extraction

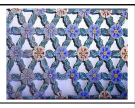
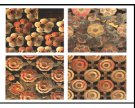
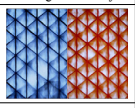
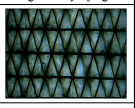
Following shows the summary of extraction result of genetic factors classifying them into inner, outer, transfer spae based on structure, function and traditional beauty.

Table 5. Genetic Factors Extraction of Korean Traditional Architecture

Division		Genetic Factors of Korean Traditional Architecture			
		Genetic Factors	Representative examples		Contents
Structure (Exterior space)	Lay out	Building placed in the center of the vertical and horizontal axis (baesanimsu)	 Baekje Gongsanseong Oond	 SeonAmSa Map	River (地) ↔ building (人) ↔ heaven (天) South (水) ↔ building (人) ↔ North (山)
	Architecture	Vertical axis: Stylobate(地)↔column (人)↔Roof(天)	 Gaesimsa SimGeonDang	 Hwaeomsa 9th-floor Hermitage	Stylobate is hell, the roof symbolizing wing, of the Bird, column symbolizing the cosmic tree
		Wooden post-and-lintel construction	 Yunjeung old houses jong Institute	 Buseoksa Beomjongru	combination Technique put together to create a space facing each other Wood and wood without the use of nails
	Space	Horizontal Axis: Exterior space↔transfer space↔Interior space	 Yunjeung old houses jong Institute	 Damyang myeongokheon	Hanok were developed transfer space
Function(interior space)		Natural Heating System: Goodle (ondol)	 Chilbulsa ahjja room	 Chilbulsa ahjja room	Goodle is Our nation's unique heating techniques
		Natural cooling system	 Haeinsa Beopbojeon	 Hahoe Village chunghyodang	Natural convection system according to a built-in lattice in different sizes
		Natural Ventilation Systems	 Seonamsa toilet	 Seonamsa toilet	Natural ventilation system through up and down with winds
		Variable partition system: variable wall structure	 SoonJeonghyo Empress Yoon-parent home	 Yunjeung old houses Sarangchae	Hanok is characteristic that can produce a variable-space consolidation and detachable
		Built-in storage space: Hair closet, alcove	 Haeinsa Buddhist monks room	 Changdeokgung yeongyeongdang main house	Must be empty space can be converted into various places

Be auty	Transfer space	Entry area: bridges 1	 Gaesimsa wooden bridge	 Songgwangsa stepping stones	When the initial entry Symbolize to get into 聖 (interior) from 俗 (exterior) by going across the bridge to install the pond
		Entry area bridges 2	 Songgwangsa paradise bridge ChongRyangGak	 Songgwangsa NeungHeogyo woohwagak	The bridge is ambiguous boundary role to connect the interior space and exterior space
		Entry area door 1	 Yeongju Sudori ManjukJae	 Songso old houses inside and outside the fence	Door yard is connected to interior and exterior paradoxically and Cose areas of Door are experiencing with the inside
Beauty	Transfer space	Entry area: door2	 Changdeokgung yeongyeongdang Middle door	 Haeinsa phoenix door - Iiju door	Architectural Space with a Directional Along the North-South Axis By superimposing the door
		Entry area door3	 Youngsanam Woo-Hwa pavilion pavilion lower door	 Haeinsa SudaraZang JongDoor	In the Case of Bottom Entry pavilion, The upper is used as pavilion, the lower is the role of entrance
		Entry area: Stairs	 Beomeosa Temple	 Buseoksa Temple	Taking Advantage of the Difference in height of the terrain with an elevation of continuity and dimension through stairs
		Central area: Yard	 Yangdong Village gwangajeong	 Changdeokgung yeongyeongdang	Korea's yard by emptying completely, recognized as an extension of the interior space depending on the application
		Central area: Stylobate	 Yangdong Village SeobaekDang	 Yangdong Village HyangDan	Adjusting the height and width of the Stylobate, depending on the size of the building
		Central area: Veranda	 Changdeokgung yeongyeongdang	 Bongjeongsa Daeungjeon	Ondol placed in front of the most veranda
		Central area: Hall	 Yangdong Village gwangajeong	 Hamyang jeongyeochang old houses	By emptying the hall, it can be utilized depending on the application This being the cleanest place in the home and center as a place dedicated to the trails
		Central area: Numaru	 Yangdong Village simsujeong	 Yangdong Village gwangajeong	Numaru is the space to attract the magnificent scenery of outside on the house by open of three sides
		Central area: pavilion	 Byeongsan seowon	 Byeongsan seowon	Pavilion Type Building stands the two sides to extend indefinitely the interior to the outside while attracting the outside to the inside
		Central area: Railings	 Yangdong Village simsujeong	 Hamyang jeongyeochang old houses	Railing at the Hanok is absolutely for molding a hanok gorgeous curves, sculpture, etc.

Beauty	Transfer space	Subarea: summerhouse1	 Soswaewon gwangpunggak	 Damyang myeonangjeong	The house of builting to play or rest in a great scenery place .Without walls, only pillars and a roof, but it recognized interior space
		Subarea: summerhouse2	 Changdeokgung gwanramjeong	 Changdeokgung aeryeonjeong	There are many summer house of different all shapes and sizes. What are melt, The characteris tics of Korean people reluctant to repeat
		Subarea: corridor	 Changdeokgung yeongyeongdang	 Gyeongju Bulguksa	Long Corridor with a roof over the main part of the Religious building or palaces building
	Interior and exterior space	Natural Materials1-Wood, Clay, Stone	 Gaesimsa SimgeonDang	 Ssanggyesa flower fence	Hanok is that the principle of using natural Materials intact where appropriate
		Natural Materials2-Clay, ganghoe compaction	 HaePoong buwongun yuntaekyoung house	 Yangdong Village HyangDan	Hot air rises and Cool Air of the Backyard through the hall Causes convection
		Natural Materials3-Granite, brick	 JongMyo JungJun	 JongMyo JungJun	The courtyard of Korea does not have a cloth-clad case. However, the solemn and sacred space paved with brick or Stone Tiles
		Natural Materials4-Korean tile, thatch, wood plates	 Byeongsan seowon	 Samcheok Kim Jin Ho houses	Neowa house: House From the roof of wood or stone plate Gulpi house: House followed roof by a thick bark
		Proportionality1	Sudeoksa Daeungjeon	Baekdamsa meditation room	Elevation of the hanok is to show the essence of warm human abstract immaculate and refreshing
		Proportionality2	SoSouSeoWon HackGuJae	SoSouSeoWon JiRackJae	Designed for the operation with the human body scale
		windows and Doors1:Variably open the door	Yangdong Village gwangajeong	Asan maengssi haengdan	lattice is revealed the configuration of the line in the exterior ,and interior being perceived as a continuous surface with the interior walls
		windows and Doors2:Wooden plate	Yangdong Village gwangajeong	Sunheung Hyanggyo younggwiLou	Wooden plate door is divided into the Cage-Wooden plate door in the Framework and boards door without the Framework
		windows and Doors3: lattice	Songgwangsa HaSadang lattice	Gangjingun muwisa lattice	Lattice are a collectively that windows and doors made of thin rib weave in the Framework. The Names are subdivided according to the appearance to create intersect of lines and lines of bars
		windows and Doors4: Flower lattice	Jeungsimsa Daeungjeon flowers lattice	Jeungsimsa Daeungjeon flowers lattice	Flower lattice door of the temple is Simple, crude and the Cultural heritage that warm emotion permeated
		Colors1	Buseoksa Temple ZoSaJeon	Sudeoksa Daeungjeon	Simple and Neat, Do not flashy and contrary to the whole harmony, rather than being pronounced

Beauty	Interior and exterior space	Colors2	 Daeheungsa cheonbuljeon	 Yongmunsa yunjangdae	Korea is often to keep the same color tone as a whole
		Colors3	 Beomeosa AnSimLyo	 Beomeosa AnSimLyo	Light transmitted through the ever-shoji paper
		Colors4	 Changdeokgung yeongyeongdang	 Andong uiseong Kim jongtaek	Wide range of uses so that you have a primordial tendency of white worship
		Line1: Roof	 Damyang Seohadang	 Damyang sikyoungjeong	Roof line characteristic of Korea, A ridge line and eaves line would form flexible curve side-by-side
		Line2: Fences	 Haeinsa fence	 Hahoe Village fence	Korea's fence low into a human scale, and composition in compliance with the terrain topography
		Humorous1	 Andong Poongsan Kim jongtaek around fence	 Wanju Songgwangsa chimney	Korea's space is lurking everywhere the humorous elements makes you smile to see people
		Humorous2	 Yangdong Village gwangajeong wickets	 Hahoe Village yangjindang wickets	Wickets which is directly connected to the main house-door, Man went to dwelling in the outer house privately
		Humorous3	 Songso gotaek fence	 Yangdong ganghakdang bulbalgi door	Intended to create a hole in the wall so you can see people stepping up to the gate in the outer house
		Tasteful1(Wind Road)	 Nanping Moon bonri segeoji	 Bumadowi bakyounghyo houses	Hanok is open to allow to pass through the wind road without being interrupted
		Tasteful2(Waterway)	 Soswaewon	 Seonamsa	Waterway as a factor that binds each of the buildings that are continuously
		Garden: Naturalness	 Jindo unrim Sanbang	 Damyang myeongokheon	Minimize artificial trail and a natural garden as it was originally

(4) Synthesis of genetic factors extraction

Following is the summary of extracted genetic factors according to spatial features of Korean traditional architect by structure, function, beauty.

First, it can be classified into planning principle part according to horizontal and vertical axis such as location, allocation structure, design structure(stylobate-column-roof, construction method), spatial structure(inner, outer, transfer space), second, functional part regarding scientific principle of hanok such as natural heating

Table 6. Synthesis of Genetic Factors Extraction

Division			Genetic Factors Extraction of Korean Traditional Architecture			
			Vertical Axis		Horizontal Axis	
Structure (Exterior space)		Layout	River (地) ↔ building (人) ↔ heaven (天)		South (水) ↔ building (人) ↔ North (山)	
		Architecture	Stylobate(地)↔column(人)↔Roof(天)		-	
			Wooden post-and-lintel construction		-	
		Space	-		Exterior space↔transfer space↔Interior space	
Function (Interior space)		Natural Heating System	-		Goodle (Ondol)	
		Natural cooling (ventilation) system	-		In summer the cool hall, different size windows of around the walls (ventilation, ventilation and humidity control)	
		Variable partition system	-		Variable wall structure	
		Built-in storage space	-		Cupboard, alcove, attic	
Traditional Beauty	Interior and exterior finishes and patterns	Doors and windows	-		Sabunhapdoor, bulbalgidoor, panmun, salmun, kkotsalmun	
		Colors	Color of Korea is not flashy, simple and neat, and should be careful not to violate than being the prominent for full harmonization			
			Light transmitted through the shoji paper			
			White worship			
	Exterior space/Transfer space	Transfer space	-		Bridge, Doors, Stairs, Stylobate, Veranda, Hall, Numaru, Pavilion, Railing, summerhouse, Corridor	
		Natural materials	Buildings, fences	Yard	Stone flooring	Roof
			Wood, Clay, Stone	Clay, compaction ganghoe	Granite, brick	Korean tile, thatch, wood plates
		Line	Roof		fences	
			Flexible curvaceous		Low composition in compliance with the terrain topography	
		Proportion	Building Exterior		Space	
			Elevation of the hanok is to show the essence of abstract of warm human immaculate and refreshing		human scale: Hanok is designed to meet the body scale and behavior to suit human proportion	
		Humorous	Korea's space is lurking everywhere the humorous elements makes you smile to see people . The feeling of someone more important than the representation of the object itself			
			Wickets which is directly connected to the main house- door, Man went to dwelling in the outer house privately			
			Hole in the fence - the intended allow the homeowner to see the man stepping on Main			
		Tasteful	Wind road, Waterway			
		Garden	Characteristic of Korea Garden Culture is 'Naturalness'. This minimizes the artificial signs and natural gardens, as it did from the original			

(Goodle), natural cooling(convection), natural ventilation system. This would act as a factor that determines eco-friendly energy technology of model development (plan) of annex of public buildings in new hanok Type that will be developed in the future. Additionally, built-in storage, variable partition system through windows and doors that open can be considered as functional parts regarding internal space utilization of hanok, and these features will act as a factor that determines planning standard of internal space in new hanok Type with application of modern architect technique that will be deduced afterwards. Third, traditional beauty of internal space such as windows and doors, color will act as a traditional planning factor of new hanok Type service facilities. Finally, for overall appearance plan of service facilities in new hanok Type, planning standard that considers traditional beauty of outer space such as natural material, line, proportion, humor, wind current (wind way, water way) is needed to be presented. Natural material belongs to the development of new material that will be applied to new hanok Type service facilities and it will act as a planning standard that can be utilized upon model development of new hanok Type service facilities.

4. Conclusion

This research sets developmental direction of model as a basic research for model development of new hanok Type service facilities and extracted genetic factors of Korean traditional architect through vertical (form), horizontal (space) analysis based on structure, function, beauty then examined possibility as a planning factor for tradition succession. This research extracted planning factors as a primitive standard regarding genetic factors of Korean traditional architect as a basic research. However in order to apply it to actual service facilities in the future specific target selection and field applicability review are necessary and there is a need for follow-up research related to development of design manual and planning standard that can be utilized widely based on the result. Especially in follow-up research, there is also a need for a study on standard and system of objective type classification that can reflect variability of public buildings in new hanok style that will be developed in this research.

This research is meaningful as a basic research that extracts, proposes genetic factors of Korean traditional architect as a planning factor for tradition succession suitable for public buildings in new hanok Type so that it can be referred to by people, local governments and public organizations affiliated with expansion, distribution policy of hanok in recent years. The practical planning standard using genetic factors proposed in this research can be said to have its meaning and value as a common standard for distribution and expansion of new hanok Type public buildings.

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