

High Density Dilemmas: Apartment Development vs. Urban Management Plan in Seoul

Sung Hong Kim*

고밀도의 딜레마: 서울의 아파트 개발과 도시관리계획

김성홍*

ABSTRACT : This paper examines 24 apartment complexes that were in the review process by the Seoul Metropolitan Government between 2013 and 2017. First, it overviews the laws governing apartment complex construction, the four major development tools, and the control mechanism known as ‘Floor Area Ratio’ (FAR). Second, it analyses the urban and architectural morphologies of the complexes, by identifying the interconnectedness of quantitative variables such as scale, density and height, and examining how these variables relate to the unit plan arrangement and the building layout in the complex. The study discovered that there was a proliferation of stereotypical unit plans and building layouts regardless of the specifics of sites and locations. This has been exacerbated by the conflict between short-term governmental policies on public housing supply and the long-term urban management plan, which has led to greater urban discontinuity and regional imbalance. The paper argues that high-density, large-scale apartment development contributes to a paradoxical combination of *heterogeneity* in its urban morphology and *homogeneity* in its architectural typology. This paper calls for the integration and coordination of the urban management plan with architectural design as the proper avenue for the establishment of a more sustainable high-density living environment in Seoul.

Key Words : High Density Development, Apartment Complex, Urban Management Plan, Floor Area Ratio (FAR), Urban and Architectural Morphology

요약 : 이 연구는 2013~2017년 동안 서울시 도시건축공동위원회와 건축위원회의 심의 대상이었던 24개 아파트 단지를 분석하였다. 본문은 크게 두 부분으로 구성된다. 첫 번째는 아파트 개발 관련법, 네 가지 아파트 사업방식, 법과 지구단위계획에서 용적률 관리 체계를 고찰했다. 두 번째는 24개 사례에서 단지 규모, 밀도, 높이 같은 정량적 변수와 단위 평면, 동 유형, 단지 배치 등 물리적 특성을 분석하였다. 연구 결과, 아파트 단위 평면과 배치 방식이 고착화되고, 장소와 관계없이 양산되는 것으로 확인됐다. 또한 단기적 공공주택 공급 정책과 장기적 도시관리계획의 괴리가 도시조직의 불연속성과 지역 간 격차를 심화시키고 있는 것으로 조사됐다. 이 연구는 고밀 대규모 아파트 개발이 서울에 나타나는 도시 이질성과 건축 동질성의 주요 원인이 된다고 지적하고, 지속가능한 고밀도 주거환경을 조성·관리하려면 평면적 도시 계획과 입체적 건축설계를 통합하는 도시관리계획의 수립과 운용이 필요하다고 제시하였다.

주제어 : 고밀개발, 아파트 단지, 도시관리계획, 용적률, 도시건축 모폴로지

* Professor, Department of Architecture, University of Seoul(서울시립대 건축학부 교수), E-mail: shkim@uos.ac.kr, Tel: 02-6490-2774

** This work was supported by the 2015 Research Fund of the University of Seoul.

I. Introduction

The city of Seoul has long presented difficulties to the government's urban management authority in terms of formulating and implementing a cohesive plan for housing development that addresses the city's long-term social and economic needs. The main issue is density, brought on by the enormous demand for housing in and around the compact city core. While developers relish the demand for housing and look to maximize living space within a given plot of land, governing bodies have sought to create constraints to limit some of the adverse effects of rampant densification.

But are the current sets of regulations and systems having any positive impact on architectural design and the urban fabric within the city? Is density truly being managed by the authority in ways that add cohesion and vitality to the lived space? A basic survey of the cityscape would certainly temper any optimism. One issue the authority faces is the indeterminate quality of density. While there are elaborate measures to calculate densities, there is a lack of social consensus about the quality of urban space in relation to density. The desire to maximize livable space, coupled with Korea's unique housing market, has spawned what some people consider the architectural blight of Seoul: stereotypical large apartment units and complexes, which are ubiquitous throughout the city but remain the model of choice for housing developers.

There have been a substantial number of

studies that have criticized Korea's propensity to erect high-rise apartment complexes from a socio-cultural perspective. But there has not been much examination of the impact of these apartment complexes in terms of the relationship between architecture and urbanism. The aim of this paper is to outline the interconnectedness of quantitative variables such as scale, density and height, and examine how these variables relate to urban and architectural morphologies: unit plan arrangement, building layout and the boundaries of complexes with adjacent streets and areas.

This paper examines 24 apartment complexes which were in the review process by the Seoul Metropolitan Government between 2013 and 2017. During this period, the housing market was booming for the first time since the global financial crisis of 2008, due to the loosening of loan regulations and approval requirements for demolition and reconstruction. The paper addresses the conflict between short-term governmental policies on public housing supply and the long-term urban management plan. Finally, it calls for the integration and coordination of the urban management plan with architectural design as the proper avenue for the establishment of a more sustainable high-density living environment in Seoul.

II. Background of Apartment Construction

Most apartments in South Korea are owned or rented by individuals. A tenant pays a lump-sum deposit to a homeowner, and the homeowner

gains the profit from the interest of the deposit. As of March 2018, the ratio of deposit to resale value is 74.7% for Korea, and 68.7% for Seoul (Korean Statistical Information Service). This unique system, *jeonse*, is the product of a steady rise in property values and high interest rates during an earlier period of rapid economic growth and urban concentration. Because of this, many Koreans still look at the apartment unit as a commodity that is bought and sold as a short-term real estate investment rather than as a living space. Owners buy and sell their houses frequently based on speculation while many tenants move every two year seeking better lease terms.

While land and homeowners may care about the scale and density of the apartment complex development, redevelopment and reconstruction they are investing in, they have little say in the matter. Apartment complex projects require heavy expenses, laborious processes, and long project terms. Consequently only seasoned developers, large construction companies, urban engineering firms and a few specialized architecture firms can handle the entire processes on behalf of land and homeowners. People have to take ownership of new building units long before construction begins. And developers are reluctant to move away from tried-and-true designs that sell well in advance, seeking only to maximize the sellable floor area of their apartment buildings.

The high-rise apartment has become Seoul's most common residential building type, growing in concentration within limited urban areas for

the last several decades. In 2015, the total gross floor area (GFA) of high-rise apartments comprised 61% of the GFA of all residential buildings in Seoul, and 44.8% of households (1.61 million) live in apartment buildings (Kim, S.H., et. al., 2016: 32-33).

The first apartment was built at Jongam-dong in Seoul in 1957. It consisted of 4 buildings with 152 units, and each building followed a 4-5 story single corridor plan, with 2-bedroom units of about 57 m² each. Seven years later, the first large complex, Mapo Apartments, was built at Dowha-dong in Seoul. It consisted of 10 six-story buildings (Park, C.S., 2013: 061-063, 081-087). Since the construction of these earlier models, the scale of apartment buildings and their site areas have steadily increased over the last six decades. In the 1970s and 1980s, a 15-story building was considered high-rise. Today, most land owners and developers try to reach 35 stories, the maximum set by Seoul's Urban Basic Plan (UBP). A plot size of 10,000 m² is now seen as the threshold for an apartment complex, and it is not unusual for a complex to be built upon a plot larger than 100,000 m².

1. Background of the Research

While there has been a substantial amount of literature on the apartment written in Korean within the field of city planning and real estate development, there is little written in English that offers a critical examination of the history, physical features, and socio-cultural implication of the apartment. Only a few exceptional cross-

cultural studies from outsiders, such as ‘Apartment Republic’ (Gelézeau, V., 2007), have taken a look at Korean society through the apartment. There is growing need for interdisciplinary English literature on the apartment in urban and architecture studies.

This research attempts to examine the architecture and urbanism of Seoul by closely looking at the morphology of the apartment. The various theoretical frameworks for ‘morphology’ have been outlined and defined in the context of Korean cities in previous research (Kim, S.H., 2004; 2013: 137-139; 2015: 126-127). Historical studies of Seoul’s urban form helped to distinguish the methodologies for this study (Song, I.H., 1990; Lee, S.K., 1993; Yang, S.W., 1994; SDI, 2009). In this paper, the morphology is defined as an inseparable physical entity encompassing urban form and architecture, comprising the scale, pattern, shape, and topological relationship between street, block, plot, building plan and layout.

Two lines of prior research helped to contextualize this study. The first line is a comprehensive overview of the history and transformation of the Korean apartment, which was compiled by a research group (*Gongdong Jutaek Yeonguhoe* [Housing Research Group], 1999; 2007). Here, the examination of the large-scale apartment and its private and public implications helped to build the temporal and spatial scope of the study (Park, I.S., 2013; Park, C.S., 2013). The second line is found in the case studies of the spatial layouts and boundaries of the apartment (Sohn, S.K., and

Kang, G.H., 2001; Cho, M.S., and Yang, S.W., 2010; Seo, E.G., Choi, Y.J., and Choi, J.P., 2014; Byun, N.H., and Kim, M.S., 2015). The relationship between the quantitative variables, such as floor area ratio, and the planning criteria of the complex also helped to set the research questions (Chang, Y.B., Lee, S.Y., and Ahn, K.H., 2000a; 2000b).

2. Laws Governing Apartment Complex Construction

The construction of apartment complexes in Korea is governed primarily by three laws: the Building Act (*geonchuk beop*), the Housing Act (*jutaek beop*), and the Act on the Maintenance and Improvement of Urban Areas and Dwelling Conditions for Residents (AMIUDR, *dosi jeongbi beop*). The Building Act defines the apartment building as ‘a multi-family house taller than 5 stories,’ and provides general guidelines for structure and safety. However, the process of construction, supply, and management of the apartment building as a separate building type relies heavily on the Housing Act. The act was originally established in 1972 as a special legislation, the Housing Construction Promotion Act (*jutaek geonseol chokjin beop*). The goal of this act was to expedite mass construction of housing to accommodate rapid rural migration to the Seoul Metropolitan Area.

The Housing Act focuses on the planning, construction, and sale of large-scale apartment complexes, called *danji* in Korea. *Danji* refers a group of apartment buildings, its ancillary

facilities and land area. The site penetrated by public roads with a certain width shall not be considered a single *danji*. Thus a *danji* is a single land parcel with buildings regardless of land size. It is not unusual for an apartment complex larger than 100,000 m² to consist of very few land parcels. It is striking to compare the size of these parcels with the average plot size in Seoul, which is between 250 m² and 300 m² (Kim S.H, 2015: 141).

Legally there are four ways to implement an apartment complex project. Two are within the Housing Act: Housing Construction (*jutaek geonseol*) and Housing Remodeling (*jutaek remodeling*). The other two are within the AMIUDR: Housing Redevelopment (*jutaek jaegaebal*) and Housing Reconstruction (*jutaek jaegeonchuk*).

Housing Construction (HC). HC is initiated by an association consisting of a group of land and homeowners or by a developer. The Housing Act requires approval of the project by a city government if the number of units is larger than 30. The government's intervention in the process is minimal because the project operator is private.

Housing Remodeling (HRM). Unlike the other three projects, HRM does not demolish existing buildings, but renovates and expands floors areas. No more than three stories can be expanded vertically, or new space can be partially extended horizontally. Because of this limitation on the scale of the expansion, HRM does not substantially increase floor areas like other projects.

Housing Redevelopment (HRD) & Housing Reconstruction (HRC). These two tools are different in legal terms, but they are similar in the execution process. The main difference is that HRD replaces low-rise houses with high-rise apartment buildings, whereas HRC replaces medium-rise apartment buildings less than 40 years old with taller apartment buildings. Both are operated jointly by the private sectors and the local government. The local government initiates or intervenes in the designation of project district and project initiator, and the approval of an urban management plan.

All four types of projects are subject to review by the Urban Planning Commission or the Urban Architecture Commission, and then later by the Architecture Commission of the Seoul Metropolitan Government. The role of these Commissions is to evaluate the overall qualitative and quantitative aspects of projects before they go further onto permit processes.

3. Floor Area Ratio Control and the District Unit Plan

Among the various considerations for urban and building density, Floor Area Ratio (FAR, *yong jeong nyul*) is fundamental to planning and design in Korea. Although *yong jeong nyul* literally means 'volume ratio,' FAR is defined as ***the ratio of a building's total floor area to the size of its plot***. Due to the dense, compact, and irregular urban fabric of Seoul, and its high land prices and plot-based building ordinances, FAR is the critical variable for determining the

Table 1. FAR limit by Zoning Designation in Seoul

[Source: Seoul's Enforcement Decree of the Urban Planning Act, Article 55]

Zoning			Law and FAR Limit		
			NLPUA, National	Enforcement Decree of NLPUA, Seoul	Enforcement Decree of Urban Planning Act, Seoul
Residential	General	Class-2	< 500%	150 ~ 250%	< 200%
		Class-3		200 ~ 300%	< 250%
	Quasi			200 ~ 500%	< 400%
Commercial	Central	Outside Downtown	< 1,500%	400 ~ 1500%	< 1,000%
	General	Outside Downtown		300 ~ 1,300%	< 800%
	Neighborhood	Outside Downtown		200 ~ 900%	< 600%
Industrial	Quasi		< 400%	200 ~ 400%	< 400%
Green			< 100%	50 ~ 100%	< 50%

feasibility of development based on the return on investment. Land owners and developers endeavor to maximize usable and rentable floor areas for higher profit. At the same time, the government uses FAR as the most efficient metric to control the density of plots, districts, areas, and cities. Inevitably, there is a push-pull dynamic between the private sector which attempts to maximize FAR and the government which restricts it by regulation.

The limits on FAR are regulated, firstly by the National Land Planning and Utilization Act (NLPUA, *gukto gyehoek beop*) which is the highest legal framework for urban planning, and secondly by Seoul's Enforcement Decree of the Urban Planning Act (Seoul *dosi gyehoek jorye*), within the ranges prescribed by the NLPUA. The basic rule is that limits are imposed by zoning designation. In Seoul, for example, the FAR limit for Class-2 General Residential areas is 200%. This comprises the

second largest portion (23.3%) of the total administrative area of Seoul (605.6 km²) (see Table 1).

The NLPUA states that apartment complexes can only be built on Class-2/Class-3 General Residential, Quasi-Residential and Quasi-Industrial areas. Their respective FAR limits are 200%, 250%, and 400%. Therefore, the maximum FAR for an apartment complex in Seoul would be 400%. In addition to zoning regulations, however, the guidelines of the Urban Management Plan (UMP, *dosi gwalli gyehoek*) are applied to apartment complex development as well.

The District Unit Plan (DUP, *jigu danwi gyehoek*), the core constituent of the UMP, defines a different set of FAR limits. The purpose of the DUP is to coordinate the two-dimensional land-use plan with three-dimensional architectural design. In 2000 the NLPUA consolidated Urban Design (*dosi seolgye*) from the Building Act and the Urban Detail Plan

(*sangse gyehoek*) from the Urban Planning Act (Kim, S.H., 2013: 134). As of October in 2017, there were 358 DUP Zones covering 81 km², 22.4% of the total urbanized area of Seoul (362 km²) (SMG, 2018: (2): 16).

Most apartment complexes are designated and managed either as a Rearrangement Zone (*jeongbi gyeok*), an Apartment District (*apateu jigu*), or a Housing Site Development District (*taegji gaebal jigu*). They are all legally equivalent to a DUP Zone (*jigu damwi gyehoek gyeok*).

The Rearrangement Zone is designated for urban rearrangement (renewal or regeneration) projects, including HRD and HRC. They are distributed throughout the city. The Apartment District was designated in the middle of the 1970s to facilitate the construction of large scale apartment complexes. All 137 Apartments Districts are concentrated along the Han River. The HSD District is designated for sites within the ‘new towns’ on the outskirts of Seoul. As of December 2017, the Rearrangement Zones occupied 14.9% (53.8 km²) of the total urbanized area of Seoul, and the Apartment Districts occupied 1.9% (7 km²) (SMG, 2017c: 92). The HSD Districts, developed from the 1980s to the 2000s, including Gaepo in Gangnam-gu, Mokdong in Gangseo-gu, and Sanggye and Junggye in Nowon-gu, represent 10.7% of the total urbanized area of Seoul (Kim, S.H., 2015: 130-131).

There are three levels of FAR limits: Standard FAR, Permissible FAR, and Ceiling FAR (see Figure 1). They are set up for DUP

Ceiling FAR	Standard FAR or Permissible FAR + Bonus FAR when providing open space or public facilities to the city free of charge
Permissible FAR	Standard FAR + Incentive FAR given in when satisfying particular planning and design requirements of the Urban Management Plan
Standard FAR	Base Limit for a plot or block within the FAR range set by Enforcement Decree

Figure 1. Three Levels of FAR Limit prescribed by the DUP of Seoul [Source: SMG, 2017d, Urban Planning Manual 2018, (2): 336]

Zones, Rearrangement Zones, Apartment Districts, and HSD Districts.

The Standard FAR is the starting point. An extra FAR percentage is added to the Standard FAR when certain design element requirements are satisfied, such as open space location, pedestrian connectivity, energy efficiency, or historic preservation. An incentive FAR percentage is added to the Permissible FAR if a portion of land within a project boundary is used for roads, open spaces, or community facilities. From an investment standpoint, profits are higher as the number of units for sale is increased. Most developers and land owners carefully calculate the benefits and downsides of densification, but they are usually willing to give up ownership of a portion of their land to gain extra FAR percentage and to reach the Ceiling FAR, because the profits from extra indoor floor area are higher than profits that come from ownership of the outdoor space.

In general, the Standard FAR is lower than the FAR limit for a given zoning area. The Permissible FAR approximates this limit. The

Ceiling FAR exceeds it. Therefore, the Permissible FAR is considered to be essential for apartment development, and the Ceiling FAR is the goal. The details of the incentive system are so complicated that many urban planners and architects can hardly grasp them. The general notion is that the larger the project area, the more leeway there will be to gain incentives. Various planning and design tactics are employed to enlarge the project site and to maximize FAR. In Seoul, the apartment complex is a battlefield of negotiations for density between land owners, government, developers, construction companies, planners, and architects.

III. Analysis of the 24 Projects

For this paper 24 projects were selected for analysis (see Table 2). All the projects were in the review process of the Seoul Metropolitan Government between 2013 and 2017. The projects are divided into four categories according to the implementation tool being used: 10 by HRC, 2 by HRD, 10 by HC, and 2 by HRM. As described above, the first two project types are carried out by the private sector and supported by the city government, while the latter two are solely executed by the private sector.

One of the notable features of the regional distribution of these projects is that all 10 HRC projects are concentrated within the Gangnam-3 districts: 5 at Seocho-gu, 3 at Songpa-gu, and 2 at Gangnam-gu. Also notable is that the

Dongjak-gu, which is adjacent to Seocho-gu, has the largest number of projects within an administrative district. It has 8 out of the 24 projects, and 7 out of the 10 HC projects. Only 4 projects out of the 24 are at Gangbuk, North of the Han River: 1 each at Seongdong-gu, Kwangjin-gu, Jungnang-gu, and Yongsan-gu (see Figure 2).

1. Large-Scale Development

The average site areas for all 24 complexes are 52,289 m², 2.4 times larger the standard block in Manhattan (80 m × 274 m). And it is more than 5 times the minimum size legally required for a HRC project - 10,000 m². It is also about 200 times larger than the average plot size in Seoul. Redeveloping or reconstructing a single apartment complex requires demolishing about 200 buildings, erasing the existing urban fabric, and rearranging it as a single plot. The AMIUDR lists 90 m² as the minimum plot size, and the UMP prohibits subdividing a plot into parcels smaller than 90 m². Still, a large part of the old urban center and the hilly residential areas were haphazard built using small plots like these. It means the average for the studied areas is 580 times larger than the minimum plot size defined by law.

Public roads are not permitted inside a complex, according to the Housing Act. In such cases, a complex shall be divided into two or more complexes enclosed by public roads. Since the FAR and heights of buildings are bound by adjacent public roads by regulation,

Table 2. Summary of 24 Complexes Studied

[**Project Tool**: HRC: Housing Reconstruction, HRD: Housing Redevelopment, HC: Housing Construction, HRM: Housing Remodeling, PRH: Public Rental Housing]

[**Zoning/ District or Zone**: *: Zoning Upgrade, APT-D: Apartment District, RA-Z: Rearrangement Zone, HSD-D: Housing Site Development District]

[Sources: Data was collected from the Urban Planning Bureau of the Seoul Metropolitan Government. The data may be slightly different for the completed projects.]

Name / Location (gu)	Project Tool	Zoning / District or Zone	Site Area (m ²)	BCR (%)	FAR (%)	No of Floors	No of Units
Samho 4 Seocho	HRC 1	C-3 R & APT-D	27,430	20.0	299.4	35	746
Bangbae 13 Secho	HRC 2	C-2 R & RA-Z	96,735	30.9	223.4	16	2,312
Munjeong Songpa	HRC 3	C-2 R & RA-Z	64,974	22.4	250.0	18	1,265
Gaepo 8 Gangnam	HRC 4 & PRH	C-3 R & HSD-D	73,447	29.2	335.9	35	1,995
Jamsil Miseong Songpa	HRC 5	C-3 R & APT-D	75,685	16.4	299.7	35	1,888
Jamsil Jinju Songpa	HRC 6	C-3 R & APT-D	104,030	18.8	299.9	35	2,947
Seocho Mujigae Seocho	HRC 7	C-3 R & APT-D	53,922	19.8	299.8	35	1,446
Banpo 3 Seocho	HRC 8	C-3 R & APT-D	103,219	17.1	271.7	35	2,091
Sinbanpo Hanshin 4 Seocho	HRC 9 & PRH	C-3 R & APT-D	126,577	18.4	302.6	35	3,702
Gaepo 9 Gangnam	HRC 10	C-2 R & HSD-D	51,021	21.0	259.5	25	1,678
Sub Avg			77,704	21.4	284.2	30	2,007
Oksoo 13 Seongdong	HRD 1	C-2 R & RA-Z	88,241	20.9	208.9	20	1,975
Noryangjin 4 Dongjak	HRD 2	C-2 R & RA-Z	40,753	22.8	251.6	30	860
Sub Avg			64,497	21.9	230.3	25	1,418
Sangdo 1 Dongjak	HC 1	C-2 R*	33,884	22.9	232.9	18	772
Jayang Kwangjin	HC 2	C-2 & C-3 R*	22,959	19.2	248.0	35	577
Sangdo 2 Dongjak	HC 3	C-2 R	39,627	21.1	227.9	20	951
Sub Avg			32,157	21.1	236.3	24	767
Sadang Dongjak	HC 4 & PRH	C-3 R*	28,750	19.7	299.5	29	839
Junghwa Jungnang	HC 5 & PRH	C-3 R*	11,710	28.8	299.8	32	383
Amsa Gangdong	HC 6 & PRH	Quasi R*	11,111	45.3	472.4	26	436
Sindaebang Dongjak	HC 7 & PRH	Quasi R*	21,196	47.4	469.3	38	920
Sangdo 3 Dongjak	HC 8 & PRH	Quasi R*	15,581	32.0	400.0	39	668
Nodeul Dongjak	HC 9 & PRH	Quasi R*	21,018	47.4	454.7	35	902
Sangdo 4 Dongjak	HC 10 & PRH	Quasi R*	52,172	32.5	437.9	39	2,424
Sub Avg			23,077	36.1	404.8	34	939
Ichon Yongsan	HRM 1	C-3 R & APT-D	37,638	34.0	309.0	25	750
Gaepo 2 Gangnam	HRM 2	C-3 R & HSD-D	53,259	32.2	289.8	18	2,015
Sub Avg			45,449	33.1	299.4	22	1,383
Total Avg			52,289	26.7	310.1	30	1,439



Figure 2. Location of the 24 apartment complexes

every developer attempts to maximize the size of the complex by eliminating or pushing public roads to the peripheries.

What should be noted is that the sites for HRC projects (77,704 m²) are larger than the average, whereas those of HC projects (23,077 m²) are less than half of the average. The number of units for the HRC projects (2,007) is also higher than the average (1,439). It

reinforces the general perception that Gangnam-3 districts are driving the magnification of apartment complexes.

2. Public Rental Housing

As noted above, some of the projects adopted the Public Rental Housing (PRH) program, which began by special legislation established

in 2015 for the purpose of supplying long-term rental housing for low-income earners that is cheaper than the market average. To resolve the shortage of available land and the 'Not-in-my-backyard' (NIMBY) opposition to public rental housing, the government encourages private developers to construct PRH units by giving 'incentive FAR'. The site must be located within 250 meters of a transit corridor or major transit stop (SMG, 2017b: 213-220).

Although the Public Rental Housing (PRH) program can be used in all four types of projects, it is implemented mostly with HC projects (7 of 10), compared to HRC (2 of 10) and HRD (0 of 2). It is ironic that the public housing program is employed more in private projects. The opposition to public housing with low rent is stronger in wealthy areas because residents think this will cause land and housing prices to fall in those areas.

3. Zoning Upgrades and the Maximization of FAR

The average FAR for the 24 complexes is 310%, which lies comfortably between the limit for Class-3 General Residential (250%) and Quasi-Residential (400%). However, a closer look reveals that most of the projects exceed their designated zoning limit, each making a concerted effort to capture every possible square meter of floor area allowable, bringing them just below the limit of the Ceiling FAR set by the UMP. For instance, the FAR for HRC10 (259.5%) is just below the Ceiling FAR

(260%); HRD1 (208.9%) is just below the limit (209%); HC3 (227.9%) is just below the limit (228%); and HC10&PRH (437.9) is again just below the limit (438%). All complexes achieved maximum floor areas allowable through meticulous strategies and tactics. The realized densities are the best optimal solutions given the physical circumstances and legal boundaries. HC & PRH projects have the highest FAR average (404.8 %), and HRD projects had the lowest (230.3%). The difference is because sites for 5 out of 7 HC & PRH projects were Quasi-Residential, whereas all the other projects were Class-2 or Class-3 Residential.

The study discovered that the zoning for 9 out of the 10 HC project sites were upgraded during the process of development, either from Class-2 to Class-3, or from Class-2/Class-3 to Quasi-Residential. To change zoning to the next level, certain portions of land or floor area must be handed to the local government for public use. Despite this disadvantage, landowners and developers were still willing to do it in order to get zoning upgrades to increase their overall floors area. The municipal government and politicians often attempt to achieve a zoning upgrade through an urban management plan to settle complaints and address the demands of residents and voters. Even in the review processes by the Urban Planning Commission, zoning upgrades are often taken for granted under the pretext of housing supply and demand.

Although there were no zoning changes in the other 15 projects, the FAR for each project

appears higher than those at non-apartment urban areas. For example, the HRC1 is in Class-3 Residential area, with a FAR limit of 250%. But the realized FAR is 299.4%. As seen in Table 1, all the sites except HC projects are designated as APT District, RA Zone, or HSD District. Through the incentive systems in the DUP, they all reached the Ceiling FAR.

The rationale behind all this is that getting urban infrastructure such as streets, open spaces, and public facilities in exchange for density is in the public benefit. Thus apartment complex development begins with the premise that zoning upgrades and FAR incentives are available, and the District Urban Plan, the representative Urban Management Plan, can be used as a tool to gain more floor area.

4. High-density and High-rise Stereotypes

The average number of floors for all cases is 30 stories, lower than 35-story limit set by the ‘2030 Seoul Plan,’ Seoul’s Urban Basic Plan. The HC & PRH projects have the highest average at 34 stories; and the HC projects without PRH programs have the lowest at 24 stories. It demonstrates that the public housing program accelerates verticalization as well as densification. The general strategy of apartment design is to reach the Ceiling FAR and then to make the building as high as possible. In fact it is not the FAR but the number of floors that is debated most at Seoul’s Urban Planning and Urban Architecture Commission. An axiom of apartment planning and design is that the

maximum FAR is a *constant*, whereas the number of floor is a *variable*.

The average BCR for the 24 projects is 26.7%, significantly lower than the BCR limit for Class-3 Residential (50%) and Quasi-Residential (60%). It indicates that if the FAR is the same, taller buildings with more open space are preferred. The maximization of FAR and optimization of BCR leads to a high-rise building typology with greater density; this stands in contrast with the other residential areas that consist of medium-rise houses on small and compact plots.

Individual apartment buildings have a shallow plan and wide frontage for natural sunlight from south and natural ventilation. The double-corridor plan is avoided so that all the units face one direction, southward. The wide frontage has another advantage: balcony extension. For several decades, exterior balconies of apartments have been illegally converted to interior rooms. In 2005 the government legalized the internalization of balconies with a depth of less than 1.5 meters. This is not included in the FAR calculation. Accordingly, developers and architects endeavor to make the window frontage as long as possible for the conversion of more balcony floor area. To close this loophole, the city of Seoul restricts the ratio of balcony width to apartment width. Nonetheless, the wide-frontage unit plan is firmly established as the stereotype.

Visual privacy between units and proximity to underground parking are also believed to be prerequisites for successful apartment develop-

ment. As a result, there are limited options for unit combinations and orientation. The most popular strategy is an L-shape building with 3 or 4 units facing the angle range between South-east and South-west (see Figure 3).

This predetermined configuration is suggested in the design manuals of the Korea Land & Housing Corporation (LH), a quasi-governmental agency responsible for the massive supply of

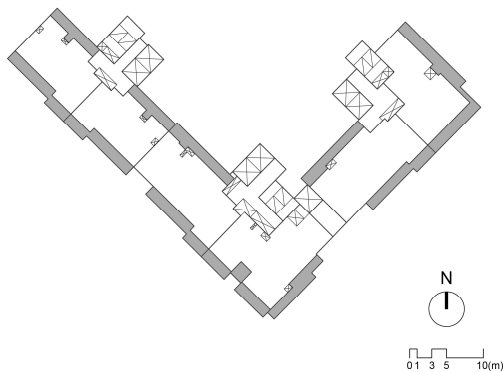


Figure 3 L-shape building consisting of 6 units within the HRC7 complex; balconies attached to front and back of apartment units will be added to the interior in the process of construction.

land and housing (LH, 2012: 104-108). Now the last challenge for developers is to put as many of these units as possible in a complex while adhering to the requirement of certain distance between buildings along the north-south axis, and of the maximum length of building frontage. There are few exceptions from this stereotypical arrangement.

Before the reconstruction of the HRC7 complex, the site was a grid pattern block facing 12-meter wide streets and there were retail and pedestrian activities. The reconstructed complex comprises of the repetition of the L-shape building breaking away from the urban axis and grid system (see Figure 4).

This new configuration creates strong spatial boundaries with zigzag buildings receding from the streets. A gigantic gate will be erected that forms a psychological entry barrier for outsiders. The retail complex at the South-east corner has strong boundaries with the inner complex.

As seen in the layout diagrams of all the

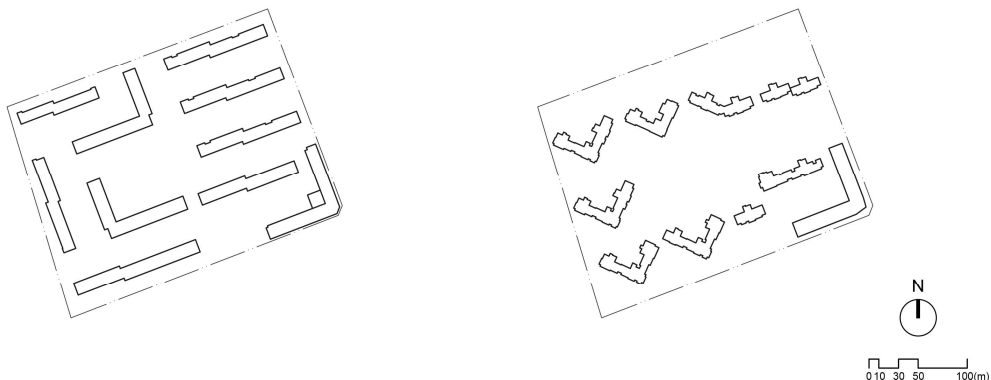


Figure 4. The HRC7 complex before and after reconstruction.

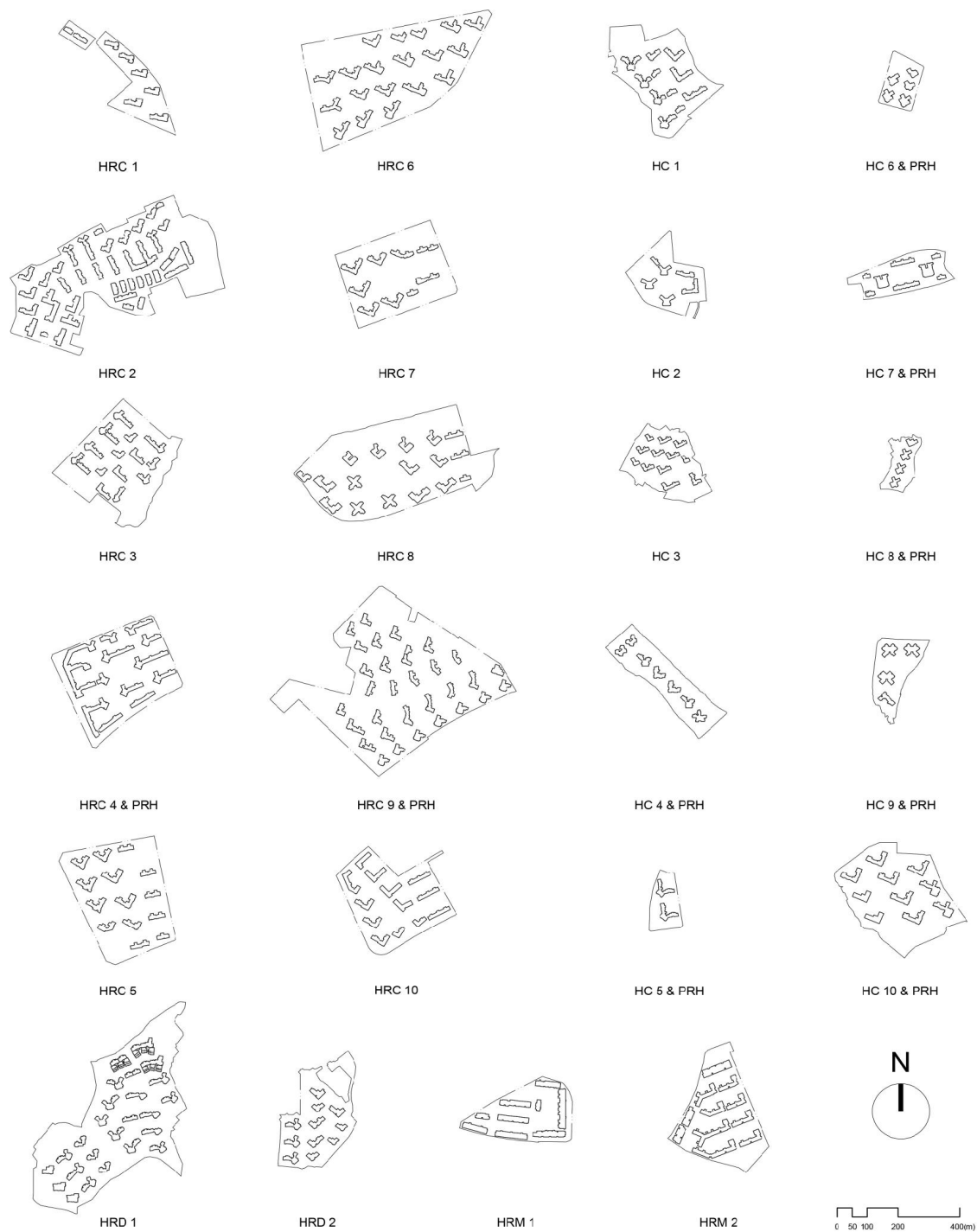


Figure 5. Layouts of the 24 Apartment Complexes Studied

[Drawn to the same scale and the same orientation, based on review materials for the Urban Architecture Commission and the Architecture Commission of the Seoul Metropolitan Government]

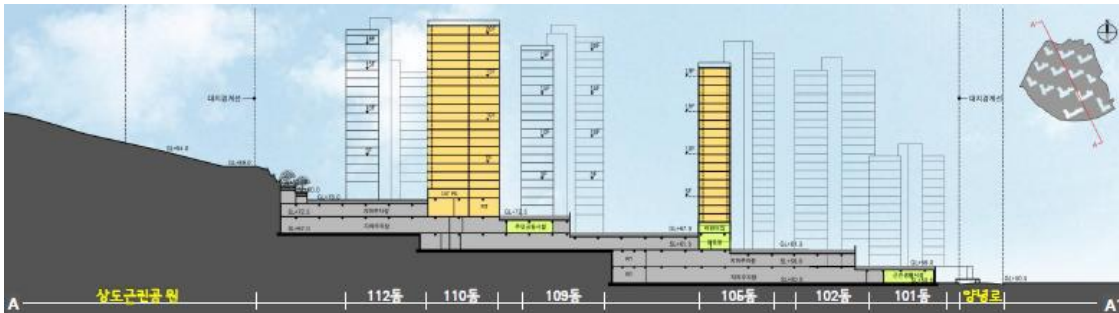


Figure 6. South-North Section of HC3 project [Source: Urban Planning Bureau, Seoul Metropolitan Government]

complexes, similar patterns emerge in most of the designs (see Figure 5).

5. Abrupt Boundaries and Urban Discontinuity

The ways internal structure impacts outside areas differs by location and project tools. Complexes on steep hillsides have irregular boundaries and abrupt transitions with adjacent areas. This is seen in the HC projects concentrated in Dongjak-gu, where land prices are lower than Gangnam-3 districts, allowing for a potentially higher return-on-investment. In particular, those at the northbound cline, generally lower middle-class residential areas, will have an adverse effect on the surroundings. Buildings with at least 200% FAR and 20-story height, achieved through zoning upgrades, cast shadows on surrounding buildings of a lower zoning designation. Many buildings north of the complex have only a few hours of sunlight a day.

With the construction of concrete platforms on which hillside buildings need to stand (see Figure 6), natural terrain gets damaged. There

is virtually no natural soil on the ground to absorb water because of the underground parking, which covers almost the entire plot. All landscaping elements are on top of artificial concrete platforms. Between the complexes and the adjacent roads there are retaining walls several times higher than a human being. Here, the continuity of urban fabric and the facilitation of pedestrian movement are weakened. Ultimately, this densification does not enhance living conditions inside and outside of the apartment complex because it hinders the comfort and conveniences of residents and would have a negative impact on long-term economic values.

In flatter sites usually denoted as ‘Apartment Districts’ within affluent areas, on the other hand, the densification of complexes leads to an increase in real estate value. The infrastructure in and out of the complexes is improved, the surrounding roads are widened, sufficient underground parking is secured, and an open space on the ground level is covered with trees, grass, and ponds. Most of the HRC projects in the Gangnam-3 districts demonstrate these features. While the spatial quality inside the

complex is enhanced, the complex itself is separated from the outside with strong physical boundaries and anti-street frontages of buildings. These physical features essentially prompt the complexes to become gated communities within the city. These socio-economic issues need to be investigated through further interdisciplinary studies.

Contrary to the city government's intentions, the public housing programs actually deepen the intra-urban gap in the quality of living space. The less wealthy areas have less opposition to public rental housing because the housing association is dissolved after construction, and less than half of the original households remain after the construction. There is no stable organizational body to monitor the quality of a sustainable environment. In wealthy areas, by contrast, a higher ratio of original residents stays after the construction. The solidarity of this community is stronger, and so is the NIMBY attitude.

The only tool for coordinating urban planning and architectural design is the DUP. As the core of the Urban Management Plan, the DUP is compulsory and legally binding. Since its inception in 2003, the framework and subsequent systems have been established and modified for the last 15 years. All the projects in the areas legally equivalent to the DUP Zones are subject to review by the Urban Architecture Commission. Yet this investigation demonstrates that the DUP is not fully executed to balance quantity of densification with the quality of the living space. There is a gap

between the goal of the public housing program and its implementation by the DUP. What is worse, it is often exploited as a tool to upgrade zoning based on market demand and private interests.

IV. Conclusion

This paper examined 24 apartment complex projects that were in the review process of the Seoul Metropolitan Government between 2013 and 2017. What it confirmed was that building decisions in Seoul are fundamentally grounded in market forces and ultimately in profit, based on developers and land owners consistently attempting to gain the maximum amount of rentable floor area within their buildings at all costs, no matter the negative impact on the urban space.

Whether it means designating part of the project as 'public rental housing', offering to give part of the property back to the city for public infrastructure, or implementing certain design elements, all of these options are considered not for what is in the public good, but rather what will provide incentives that allow developers to increase their rentable floor area, usually through greater verticalization. The government is not meeting with developers to enforce a cohesive and sustainable vision for the future of the city of Seoul. Rather, developers simply see government restrictions to space and density as part of the game to see how much they can gain within those restrictions and incentives.

Consequently, the city of Seoul bears witness to the proliferation of stereotypical high-rise apartment complex design that has a negative impact on the urban space. The *heterogeneity of the urban morphology* of Seoul is combined with *the homogeneity of architectural typology* which is driven only by market forces. Throughout Seoul we see strong boundaries and abrupt transitions between inside and outside of apartment complexes that create exclusive urban enclaves and gated communities. We see the uneven distribution of density that leads to an uneven quality in the living environment. We see the destruction of topography and excessive underground excavation that threatens the sustainability of the environment.

Currently, the influence of architecture and architects in the earlier phase of calibrating density in the Urban Management Plan is marginal. This is partly because density is understood merely at the level of the two-dimensional land use plan, and is not seen as a design element for architecture. The architects who concentrate on the specificity of individual buildings have little opportunity to intervene in the decision-making process. As long as the perceived value of large-scale development, redevelopment, and reconstruction overpowers small-scale regeneration, this problem will not be resolved easily.

To reduce mass demolition and to downsize urban development, the government adopted a new urban policy in 2012 called Street Housing Rearrangement (*garo jutaek jeongbi*). This policy was augmented in 2018 by enacting a

special law, the Act on Empty House and Small-scale Housing Reconstruction (AEH & SHRC). In 2013, the government shifted urban policy from development to regeneration through ‘the Special Act on Promotion of and Support for Urban Regeneration.’ Special districts for regeneration were designated, and a huge national budget was allocated.

Now it is the time to forge a proper and visionary urban management plan. On the whole, the unreasonable and mechanical guidelines and incentives on density need to be fully reexamined. The scale of complexes and their interfaces with adjacent urban areas must be closely evaluated before project applications are processed any further. And the distribution of affordable public housing programs across the city must be promoted uniformly, beyond the mechanisms of incentives.

The role of the Urban Architecture Commission, which is responsible for coordinating urban policies, the urban management plan, and architectural design is more important than ever. It is incumbent upon this commission to bring architectural considerations more into the decision-making processes, recognize the shortcomings of our current system of regulations and incentives, and bring to bear policy that slowly begins to ameliorate the urban fabric of the city of Seoul and enhance the lives of the citizens that inhabit it.

Notes

-The English translation of legal terminologies was obtained from National Law Information

Service. <http://www.law.go.kr/LSW/eng/engMain.do>
 -The Romanization of Korean follows the
 Republic of Korea standard (Ministry of Culture and
 Tourism Notice No. 2000-8, 2000. 7.7)
<http://roman.cs.pusan.ac.kr/>
 -Figures 2, 3, 4, 5 were drawn by Han Dayeon.

References

- Byun, N.H. and Kim, M.S., 2015, "A Study on Classification of Apartment Complexes Using Spatial Analysis Technique - Focused on Pedestrian Circulation in Apartment Complex", *Journal of the Architectural Institute of Korea Planning & Design*, 31(4): 61~68
- Chang, Y.B., Lee, S.Y., and Ahn, K.H., 2000a, "A Study on the Determinants of Factors of Floor Area Ratio in the Apartment Complex", *Journal of Korea Planning Association*, 35(4): 119~126.
- Chang, Y.B., Lee, S.Y., and Ahn, K.H., 2000b, "An Analysis of the Effect of site conditions on FAR in the Apartment Complex", *Journal of Korea Planning Association*, 35(5): 115~123.
- Cho, M.S., and Yang, S.W., 2010, "The Borderland Characteristics of Housing Renewal Projects in Seoul", *Journal of the Urban Design Institute of Korea Urban Design*, 11(2): 185~198.
- Gelézeau, Valérie, 2007, *Apateu Konghwaguk* [On the Republic of Apartments], Korean Trans by Kil Hyecheon, Seoul: Humanitas.
- Gongdong Juteak Yeonguhoe [Housing Research Group], 1999, *Hanguk Gongdong Juteak Gyehoegui Yeoksa* [A History of Korea's Housing Planning], Sejin Book.
- Gongdong Juteak Yeonguhoe [Housing Research Group], 2007, *Jugeo Danji Gyehoek* [Residential Complex Planning], Dongnyok.
- Kim, S.H., 2004, "Morphological Theory and Design in Modern and Contemporary Architecture", *Journal of Architectural History, Korean Association of Architectural History*, 40: 89~105.
- Kim, S.H., 2013, "Changes in Urban Planning Policies and Urban Morphologies in Seoul, 1960s to 2000s", *Architectural Research*, 15(30): 133~141.
- Kim, S.H., 2015, "Housing Site Development and a Shift in Urban Architecture at Mok-dong in Seoul", *The Journal of Seoul Studies*, 59: 125~162.
- Kim, S.H., Cinn, E.G., Ahn, K.H., Kim, S.B., Chung, I.S., Jeong, D.E., and Enos, R., 2016, *The FAR Game: Constraints Sparking Creativity*, SPACE Books.
- Korea Land and Housing Corporation (LH), 2012, *Wirye New Town Competition Guideline*.
- Korean Statistical Information Service, KOSIS, <http://kosis.kr>
- Lee, S.K., 1993, *A study on the morphological characteristics of city site in the late Choseon Dynasty*. Ph.D. Thesis, Seoul National University.
- Park, C.S., 2013, *Apateu* [Apartment], Seoul: Mati
- Park, I.S., 2013, *Apateu Hanguk Sahoe* [Apartment Korean Society], Seoul: Hyeonamsa
- Seo, E.G., Choi, Y.J., and Choi, J.P., 2014, "Chronological Analysis on the Hierarchy of Service Facilities as seen in the Block Plans of Apartment Complexes", *Journal of the Architectural Institute of Korea Planning & Design*, 30(11): 105-115.
- Seoul Development Institute (SDI), 2009, *Urban Form Study of Seoul*.
- Seoul Metropolitan Government (SMG), 2016, *Housing Seoul, Improving the Quality of Life*.
- Seoul Metropolitan Government (SMG), 2017a, *Annual Report on Urban Planning Commission 2016*.
- Seoul Metropolitan Government (SMG), 2017b, *District Unit Plan Guideline*.
- Seoul Metropolitan Government (SMG), 2017c, *Urban Planning Commission Manual 2017*.
- Seoul Metropolitan Government (SMG), 2017d, *Urban Planning Manual 2018, Vol.1 & 2*.

- Seoul Metropolitan Government (SMG), 2018, *Annual Report on Urban Planning Commission 2017*.
- Sohn, S.K., and Kang, G.H., 2001, "A study on the changing Trends of Site and Outdoor Planning of Korean Public Apartment Project", *Journal of Construction and Environment*, Chungang University, 9~18.
- Song, I.H., 1990, *A study on the types of urban traditional housing in Seoul from 1930 to 1960*, Ph.D. Thesis, Seoul National University.
- Yang, S.W., 1994, *A study on the type of urban tissue of Seoul in the late Choseon Dynasty*, Ph.D. Thesis, Seoul National University.
- 원 고 접 수 일 : 2018년 8월 3일
1차심사완료일 : 2018년 10월 19일
최종원고채택일 : 2018년 12월 7일

