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A Study on the Block unit architectural plan for Taepyungdong Housing regeneration-focused on the original part of Seongnam city

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Abstract

So far, large-scale apartment reconstructions focusing on quantitative aspect have been flourished. However, nowadays in the age of city regeneration, it is said that instead of apartment reconstruction, block unit housing regeneration on the existing residential areas in the original city is the answer.

So the purpose of this study is to analyze and examine the existingurban fabric of Taepyeong-dong in the original part of seoungnam city by researching on basic data of present urban spatial organization for architectural designing of block unit housing in the future. This analysis on urban fabric focuses on connectivity of exterior space which indicates residents' territorial consciousness in existing housing blocks and neighborhood streets. The identified spatial organization from this analysis areto be studied in various aspects and developed to sustain present communities with spatial supplement in architectural way ofclearer space boundary by inserting intermediate zone between public and private space of each block. In order to accomplish these purposes, the court-yard house type is selected.

This traditional type would strictly keep inside & outside territoriality of this housing block. And lower parts of this court house complex would contain various public spaces and higher parts would be more appropriate to accommodate various private housing units. Extracted fromthis existing territorial composition, the basic type of blockunit housing with a court as common field for residents is proposed.

Along the Neighborhood Street depending on the site condition, 4 block unit housing types for multifamily are proposed as basic type and type 1, 2, 3. Two things are recognized from the design.First thing is the premeditated design aspect of streets, maintaining the whole block as street faced shops and housings. This shows the purpose of preserving street system and gradual housing regeneration within the existing urban fabrics.Second is the compositional aspect of territoriality. Just like existing space composition, block unit housing with a court as common field for residents is proposed. So,the territorial composition is also sustained intact.

Therefore, this study is to investigate the condition and composition of existing urban fabric for planning housing regeneration along the neighborhood street and also to propose the whole design process of future block unit housing regeneration.

Keywords: Taepyungdong, Block Unit housing regeneration,Neighborhood street, Blockunit housing type

Introduction

1. Purpose of study

The original part of Seongnam was urgently constructed due to 'the large scale complex of Gwangju development' in 1968 for the Capital, Seoul. And Taepyeongdong is the representative residential area in oldSeongnam which is the first new city in Korea after modern period. This area was planned for sub-housing ofmigrators lived in deteriorated residential area in Seoul. And this area was designated as city maintenance district from 2006 till last year but dissolved in 2014 due to uncertainty of developing business. During this period, housing environment has been neglected and now waits for the new development method called 'city regeneration'.Therefore, purpose of this study is to proposenew housing regeneration plan for the original part of Seongnam according to analysis result of existing urbansystem.

2. Method and procedure of study

The method of this study is to classify Taepyeongdong's physical element such as housing blocks and roads types related to lot system and to comprehend housing problems like lack of open space, devastated park, alley parking hard to secure fire road and lack of community space. To improve Taepyeongdong's residential environment, it is important to verify the present circumstances, characteristics and residents' understanding of this area. Therefore, this is an analytic study on the present circumstances of the whole area before housing regeneration starts and also this is the process of confirming priority order for improvement and conservation part in housing regeneration plan.

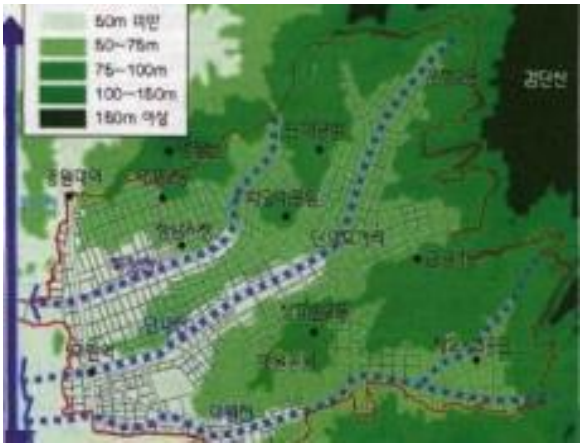
Geological Features

1. Current conditions of Taepyeongdong

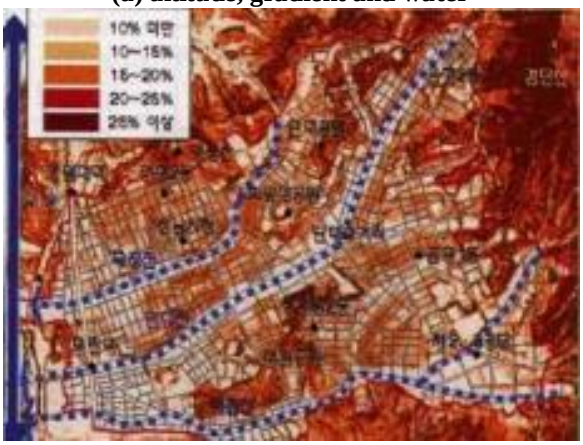
Among these areas, Taepyeongdong was planned as an initial settlement with various limits in quality & quantity aspects of housing andliving environment. Current states of lots in Taepyeongdong are partially combined but most of them maintain the original form of initial plan. Most of roads inside the residential area have very steep gradient and this was caused by grid pattern block plan placed intact on the slope. The rectangle unit block formed by grid patterned street is 2-row lot and block types can be classified by site arrangement and size. Its altitude gets higher to the east and has east-high west-low basin form.

Altitude from 75m to 150m areas are 54% of whole area and over 15% gradient area are 35.6% and partial steep slopes still exist. Also, hillside area proportion is 67.21% which is twice

of Seoul (30.94%) and most of residential are formed in the altitude over 40m. Development density of hillside is very high about 150~200%, so outside space proportion is very low that causes inadequate residential environment. [Figure 1]



(a) altitude, gradient and water



b) gradient analysis

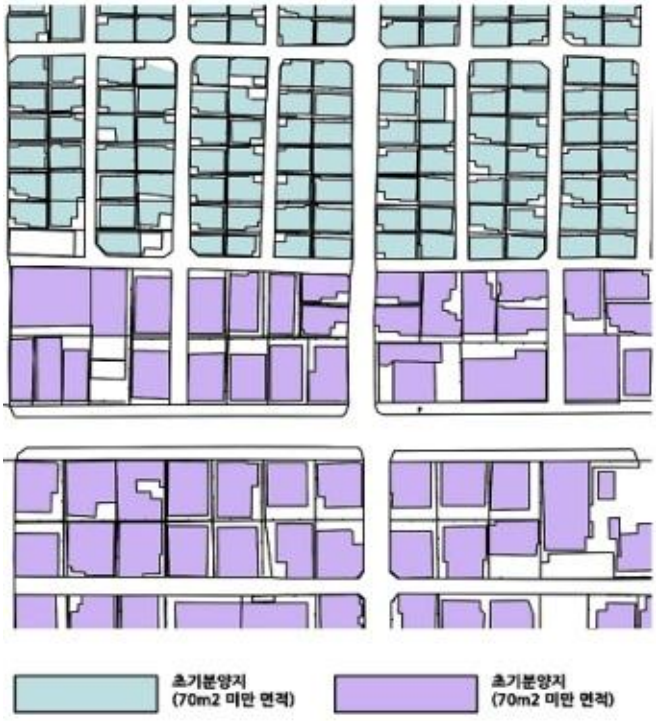
Figure1:Altitude & Gradient analysis of Seongnam city

2. Lot features

Taepyeongdong lot type is classified into the initial subdivision area formed in 1968 and the post development area formed after 1973. The initial subdivision area are (between year 1968~1973) primary in Taepyeongdong, Sanseongdong, Dandaedong, Sinheungdong and Sujindong of Sujeonggu and Joongdong, Sangdaewondong, Kumkwangdong and Eunghangdong of Joongwongu. Overall, distributedproportion of the initial subdivision area in Sujeonggu is rather high.

Urbanization was started by expansion of residential area in the suburban area around Sangdaewondongfrom 80's to 90's. Lots tend to get diversified in post development area (after year 1973). Tosummarize characteristics of housing area for Taepyeongdong, the initial subdivision area are composed of; 5~6m road, 3~4m inside passing road, 2 row lot arrangement and assembly average 7~10 houses in one block. A lot size is around 66~70㎡ which is compatible for subminiature standard and have square(near 8x8) like aspect ratio. Lots size in post subdivision is less or more than 132m^2. As seen from [Figure 2] in initial subdivision areas, there are many linear dark streets aligned with various stores and shops. These are neighborhood streets which are core areas for residents of existing communities in the middle of each dongs(villages).

[Figure 3]shows interconnection between semi-public(alley)and semi-private(lot yard)In terms of space configuration, alley is semi-public and court yard in a lot is semi-private.However, actual space occupation depends on occasional residents' activities of specific periods in seasons and weekdays, weekend.



(a) Initial Subdivision Area &

(b) Post Development Area

Figure 2 :Distribution of Neighborhood facilities with Initial Subdivision Area & Post Development Area

Public	Common area		Private
	Semi-public	Semi-private	
Main street	Alley	Lot yard	Inner house
Boundary	Boundary	Boundary	
Alley & street node	House gate Front yard	Gate roof in a lot	

Figure 3:Semi-public area, semi-private area in an alley

3. Unit housing block types

From [Figure4], most of unit blocks are aligned with main roads however, not all of unit blocks are planned that way. Variant blocks such as non-standard block type are inevitably produced because of steep slope roads, therefore sometime part of roads are disconnected and ended up with stairs, which arenot be considered as fire roads. In Taepyeong 2 · 4 dong, there are variant blocks as non-standard block type with the gap between site planning and topography.

The blocks are classified in 11 types.Block size varies depending on the width of road in different hierarchy.In order to start anactualHousing regeneration plan based on the grid pattern street system of Taepyeongdong, it is required to classify area unit blocks in terms of typology. First of all, each lot is too small for further development, therefore 2 small lot blocksfacing each othershould be consideredas onebigger unit block and then proper typology are drawn gradually and is shown in the [Figure 4].

Variant blocks should have each specificarchitectural plan for its irregularsite shapeso those variant blocks(grey) should be excluded from this study range.And as in [Figure 3], two lots facing each other is a pair in most of street block types with an alley(less than 4m) in the center between blocks as common field for residents. [Figure 5] shows unit housing block types by its length.A generalblock configuration is 2 row lots with short side of 13m~17m and long side of 42m~80m.

Number of lots in a block is 5~10 lots in 1 row.When converting average of each block scale, size of one unit lot is about 8m×8m. Depending on the block size, it is classified in to 4 types and decided from major axis distance which can be changed from number of lots and grid pattern road is partially adjusted depends on the topography.. Through this adjusted road system, block size is a bit changing, [Figure5]is classified depending on the size of each blocks.

Figure4:Basic types ofUnit block inTaepyeong 2/4 dong

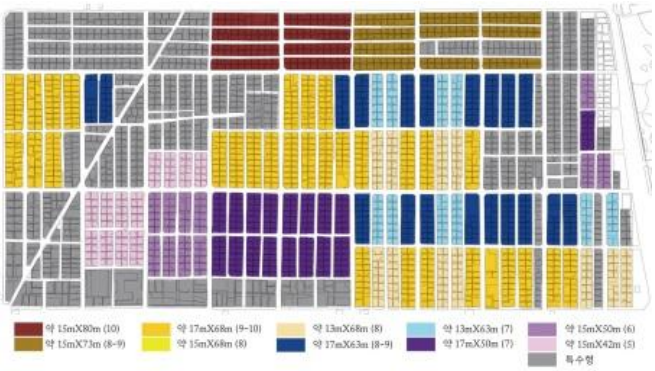


Figure5: Unit housing block types of Taepyeong 2/4 dong

4. Street types

The width of road takesan important role in giving form to housing territory.

The road wider than 4mwhich is minimum required condition is a vehicle road but in Taepyeongdong, many 2m~3m width streets exist. These streets are restricted for vehicle passing and slow down passing speed,however it is convenient for walking and also provide semi-private area in front of each house. When passing speed gets slower, residents' territorial consciousness gets stronger and higher.However, Semi-public area like an alley, this does not influenced by gradient. This shows road width is more influencing than road gradient.

As mentioned before, Neighborhood streetexistsand functions well in the center of Taepyeongdong housing area. This street maintains a role as commercial place for everyday and in terms of territory,whole street is semi-public area for the residents.

Consideredas center of surrounding blocks, various roads from outside citynaturally lead to the Neighborhood streetas if they are extended from it.

Center of neighborhood street is the highest and gets lower at each end.[Figure 6]

When approaching their home, residents tend to take a few selected easy course which are the shortest distance and less gradient from bus station to neighborhood street and this canestimate concentrated pedestrian route.

The slope of streets affects strongly on its organization of territory. Therefore, this part of street with slope more than 7% contains less residents' activities and becomes public space of mainly pass through function without sense of belonging and

territory, thus not many stores are sustained. However,alley of semi-public space is not much affected by the slope of road. This shows that territorial consciousness depends more by width of the road than its slope.

Street types of Taepyeong 2/4 dong(slope & width)

Figure6:Taepyeong 2/4 dong neighborhood street slope section

Housing regeneration plan

1. Outline of regeneration type

The site selected by combining 2 housing blocks is appropriate for block unit housing regeneration plan. To design block type housing, basic architectural plan should be designed on the grid pattern street system. Combining 2 blocks as a unit and the range is shown in [Figure 4]. The yellow site location is in the basic block type area and close to different type blocks. Deformed blocks in [Figure 4] are excluded from present study range. Majority buildings in Taepyeongdong were built during the 2nd redevelopment period and buildings age are over 25 years.Surrounding area of the site has similar circumstances of Taepyeongdong's overall lots. Classifying 4 types in grading building age for each block is shown in [Figure 7]. High density Neighborhood Street has higher potential for regeneration. The site location is next to the neighborhood street so we can assume that it has higher potential of autonomous regeneration than other surroundings.

In one block, shop front lot usually face to 6m neighborhood street but inside next lots are mainly housing, therefore 2 housing types are verified from the section, first one is single type of whole housing and second one is combined form of commercials in 1st floor~2nd floor and housing in 3rd floor.

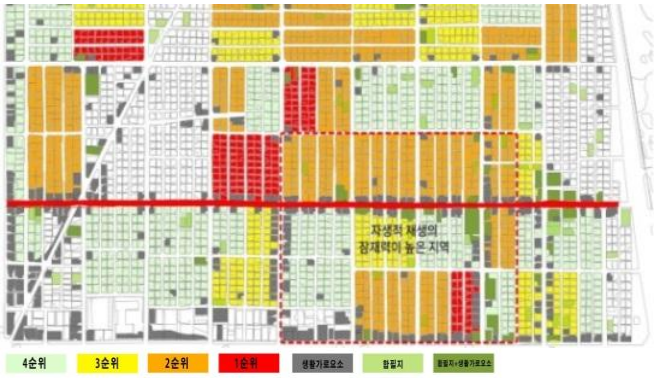


Figure7: Distribution of neighborhood facilities & Regeneration potential area

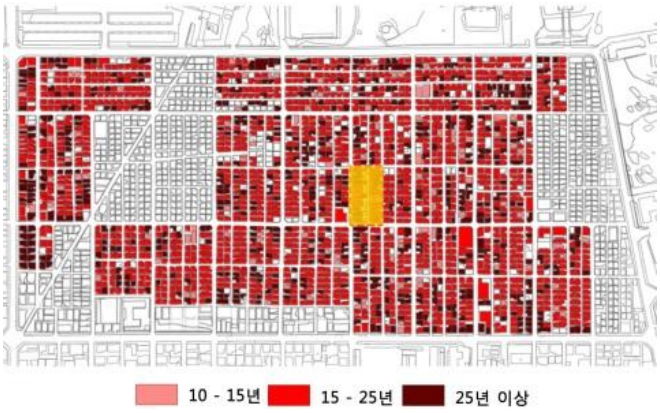


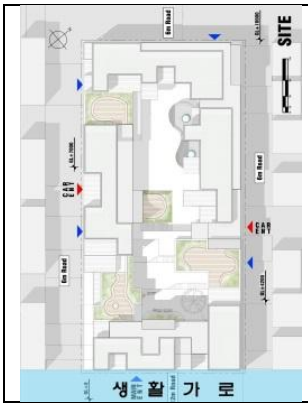
Figure8: Lot age & The site

2. Architectural plan for basic block type

First of all, this design is for modular Housing, which is conceived as the most suitable construction solution for Seounnam city with its narrow alleys. Therefore, each unit plan in different colors is based on the combinations of one module unit of 3.0m x 6.0m and a half module size 3.0m x3.0m.[Figure 9] This combination architectural plan will no doubt satisfy most of residents' requirements.

In the box outline, building coverage ratio was 59.7% and floor area ratio was 197% and those donot exceed the range so that it isdesigned according to the building regulations. Howeverbesides regulations, when considering future residents, residential public spaceratioshould bea littlebigger(standard 75%) than common apartment, there are many balcony areas which should be excluded from floor area. This proposed multifamily housing plan have more floors than general housings in existing block and bigger the floor area ratio andlasting period of sunlight and shadow become important evaluatingdesign aspects

OnB3, B2, B1 floors,80% space are composed with semi-public space for residents and parking so there is no problem of privacy and sunlight as the case of dwellings.
On B3 floor the Neighborhood street level, shops and public space like community center are provided for direct approach from the street. For B2, B1 floor, there are also direct open stairs so more public space like daycare center and 1 room typesareto be arranged for one person dwellings of the shortest occupation time in a day.



Site area2543m^2
Building area1550m^2
Gross area5010m^2
Parking area3700m^2
Number of Parking105 cars
Number of household95 households
Coverage ratio59.7%
Floor area ratio197%
Lot Size35m*72m

Figure9:Basic type architectural plan

Conclusions

Along the Neighborhood Street depending on the site condition, 4block unit housing typesfor multifamily are proposed as basic type and type 1, 2, 3.And each architectural designs are appropriately adjusted to their relevant sites. The typical site plans for each block typesare selected based on theirorientation, size and form. Depending on site conditions, these proposed4 types can bedevelopedas various architectural plans which have their own territorial and space composition.

[Figure 10, 11, 12] show each block types applied in the future residential area of Taepyeongdong. Two things are recognized from the [Figure 10, 11, 12].
First thing is the premeditated design aspect of streets, maintaining the whole block as street faced shops and housings. This shows the purpose of preserving street system and gradual housing regeneration within the existing urban fabrics. The essential relationship between sites and streets would be lost if it were a general apartment arrangement. Second is the compositional aspect of territoriality. Just like existing territorial composition, unit housing blocks with a court as common field for residents are proposed. Existing territorial composition is sustained in block unit housing type for multifamily. However,in Dandaedong,existing relation with its territorial composition and streets are disconnected by the newly built huge scale apartment complex. From this, we can tell that residents of thisapartment complex are separated from the existing urban fabrics and communities at the same time.
This kind of blunder should be avoided and respect for the existing urban fabric ought to be sustained. Therefore, in near future, rest of the other Neighborhood Street in each dongs(villages) will be regenerated as well by these Unit housing block types.

Figure10:Neighborhood streetSite plan

Figure11:study Sites of 4 types

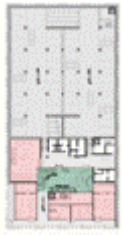
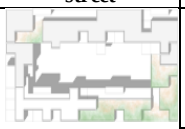
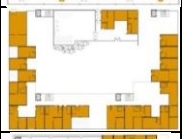
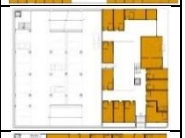
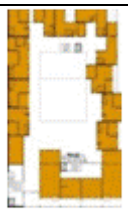
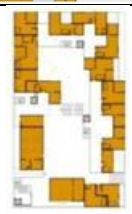
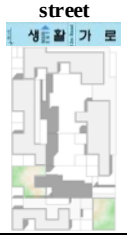
Type	Site plan			
Basic Type	**Site area** 2543m²			
	Number of household 95 households			
	Size 35m*72m	**Neighborhood street**	**Front street Neighborhood street level**	**Rear Street level**
Type 1	Horizontal type		**Front street level**	
	Number of household 95 households		**Rear Street level**	
	Size 35m*72m			
Type 2	Square type	**Neighborhood street**	**Front street level**	
	Number of household 54 households		**Rear Street level**	
	Size 35m*50m			
Type 3	Short lengthtype	**Neighborhood street**		
	Number of household 68 households			
	Size 35m*60m		**RearStreetlevel**	**Front street level**

Figure12: Site Plans for each residential block types

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