REVITALIZATION OF OPEN SPACE OF HIGH RISE APARTMENT COMPLEX
Focused on Hongsil Apartment Complex in Samsung-dong district

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ABSTRACT

The standardized high-rise apartments in Korea came to be supplied in quantity through rapid economic development and industrialization in the 1960s, and this type of housing came to be considered as a solution for limited land use for land’s topographic characteristics. Over 2/3 of the land area is mountains, and the population is concentrated in the capital area. Furthermore, a majority of Koreans came to prefer apartments as their housing option because of its proximity to urban life and rising property values. Recently, however, the apartments started to cause a variety of problems, functional, aesthetic, and maintenance due to deterioration attributable to the buildings’ life cycle. The residents of the apartments became more interested in their residential environment with the rational economic growth and improved income. These changes came to require new residential environments as alternatives that can give qualitative enhancement of pleasant life. Along with these phenomena and apartment deterioration, reconstruction and renovation came to be the alternatives for improving the residential environment and its economic value.

This thesis project will provide a methodology to solve the openspace problems of high-rise apartment complexes such as severance with neighbors, monotonous and monolithic typology, and underutilization etc. by revitalizing open spaces of high-rise apartment complex. One developing approach between the reconstruction and renovation will be proposed by comparing those values from existing research based on the sustainability. It is expected that this project will to apply pattern language of Christopher Alexander as a design methodology for revitalization of open space and to plan community space for the people who live in the same apartment complex. Patterns will be collected from a residents’ surveys to have a more specific understanding of their daily life usage needs.
ACKNOWLEDGEMENT

I would like to extend my sincere thanks to the Rutgers Department of Landscape Architecture for the support. I am highly indebted to graduate committee including Wolfram Hoefer, Holly Nelson and Laura Lawson for their guidance and constant supervision as well as for providing necessary information regarding my project and also for their support in completing this project.

I would like to express my special gratitude and thanks to Jayyun Jung, senior associate at James Corner Field Operations, for giving me such attention and time.

I also take this opportunity to express a deep sense of gratitude to Wonman Choi, director of SYNWHA Consulting Co, for valuable information he provided, which helped me in completing this task through various stages.

Lastly, I would like to express my gratitude towards my parents and friends for their kind co-operation and encouragement which help me in completion of this project.

I have taken efforts in this project. However, it would not have been possible without the kind support and help.
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Chapter 1 Introduction

1.1 Study Flow Chart

INITIATION

- AWARENESS OF PROBLEMS FROM THE SITE

ISSUES

- GENERAL RECOGNITION OF HIGH RISE APARTMENT COMPLEX

- SPECIFIC PROBLEMS OF THE SITE HONG-SIL APARTMENT COMPLEX IN KOREA

DEVELOPING METHODS

- STUDIES ON THE TASK AND THE DESIRABLE DIRECTION OF HIGH RISE APARTMENT COMPLEX DEVELOPMENT

+ RECONSTRUCTION VS RENOVATION

+ SOCIAL NEEDS

+ APPLICATION

PROPOSED SOLUTION by PROJECT

- SOLUTION ON THE HONG-SIL APARTMENT COMPLEX DEVELOPMENT
As a landscape architect
As a resident

- Personal level - fear, dissatisfaction, stress, behavior problems, suicide, poor social relations, reduced helpfulness, and hindered child development.
- Social level - they are accused of burdening existing services and infrastructure, worsening traffic problems, and damaging the character of neighborhoods (Robert Gifford, 2007)
- High-rises are not beneficial for residents (e.g., Angrist, 1974; Cappon, 1972; Conway, 1977)
- Such living environments tend to be detrimental to the social relationship within the community (Ziti, 1974; Tognoli, 1987; Keane, 1991)
- ‘The lack of open space’ is ranked as the first item (Wang and Chien, 1999)
- High-rise high-density skyscrapers leave at least 85% of the ground free for open space and other recreational facilities (Le Corbusier, 1946 & 1947)

- Cityscape is marked by hills
- Reflection of economic situation (Valerie Gelezeau, 1997)
- Underutilization of open spaces
- They weren’t designed with an understanding of who will live here and how they will use the space

- Open spaces and play area - encouraging social interactions (Gehl, 1987)
- The provision of common access - increase opportunities for informal interactions (Fleming et al., 1985)
- Greenery in residential communities - increases the opportunities for social activity and bonding among residents (Coley et al., 1997)
- Existence of interesting objects or events such as sculpture and performances - elicit interaction among strangers (Whyte, 1980)
- Water features - encourage the observers’ social interaction (Huang, 1998)

- Necessary activity
- Optional activity
- Social activity (Gehl, 1987)

- Well-planned outdoor spaces of high-rise complexes can become effective activity nodes that facilitate residents’ daily informal contacts (Bechtel, 1977)

- Sustainable value
- Environmental value
- Economical value

- Question residents about their needs

- “A Pattern Language” (Christopher Alexander, 1977)

- Revitalization of open spaces of high rise apartment complex
1.2 Background of high-rise apartment complex in South Korea

Since the 1960s, Korea has experienced rapid economic development and industrialization, and this contributed to shaping housing types. The development occurred based on capital, and the capital had to have enough capacity to hold the population in a limited area. As a result, high-rise apartments were supplied in quantity as a solution. However, the improvement of income, reduction of working hours and the enhanced standard of living of people’s lifestyle and values changed. Residents came to realize that the residential environment came to be as desolate residential space by becoming that residential environment came to lose enlivened exchange such as severance with neighbors, monotonous and monolithic building type etc. As a result, residents are accused of burdening existing services and infrastructure, worsening traffic problems, and damaging the character of neighborhoods.¹

Today, apartment complexes tend to make residents live like severed islands without communal living, even though, it has the great potential to create better communal living. If we put a little effort to improve on it, the high-rise apartment complex could utilize many advantages to improve communal living such as a sense of comradeship, similar economic level and various potential networks for the community.²

1.3 Preference of housing in South Korea

The high-rise apartment has become an important housing type in South Korea on the strength of housing preference, even though there has been a lot of controversy over the use of it. “According to the city, about 80 percent of the newly constructed buildings in Seoul were apartments in 2008, while this year about 56 percent of the city’s households lived in apartments, 13 times higher than in 1970. The number of houses and apartments in smaller buildings – known here as “villas” – fell by about 10,000 over the same period. […] In a survey of 3,560 people conducted by the country’s top lender Kookmin Bank in 2009, 73.8 percent of respondents said they wanted to live in apartments.”³

1.4 Life span of high-rise apartment

Recently, many evaluations have been conducted based on high-rise apartment deterioration over time. The more meaningful as-

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² Sangsam Han, dream of humanity living breathing apartment complex, Korean apartment newspaper, Special Contribution, translated by author
pect of this deterioration is its function rather than its physical deterioration. To analyze this lifespan of high-rise apartments, the period from when a new building was built to a reconstruction was used. To get this period, the total number of existing houses was divided by total number of new houses which are built every year. The total housing stocks were 104,590,000 and the newly constructed housings were 1,090,000 in the United States in 1991. According to this data, the interval of housing reconstruction is 103 years in the United States. The same method gives 141 years in England, 86 years in France, and 79 years in Germany. In Japan, the period is about 30 years, due to the fact that the total housing stock is 45,000,000 and 1,500,000 new housings are provided annually. However, in South Korea, it is hard to apply this method to get the lifespan because the housing distribution rate is less than 100%. So, a sample survey was carried on 12 apartment complex samples, and determined that the lifespan was 19.8 years. 

1.5 Reconstruction and renovation

According to a study by Yongmin Kim, reconstruction’s business profit is increasing at similar rate with every 10% increase of floor area ratio. The reason for this is that the business profit is increasing with the total floor area. However, the situation in high-rise apartment is different. The floor area rate’s strong influence on business value is already exceeding 300%, so, it is hard to expect profit from reconstruction. Furthermore, reconstruction is hard to proceed because of environmental and social aspects.

Recently, apartments in Korea underwent reconstruction or demolition for a variety of reasons in about every 20 years due to a decline in social and functional aspects, rather than the decline in bearing strength of the structure. 64.4% of reconstructed apartment were rebuilt before they were 20 years old, and this will make the speed of a waste of construction resources 3-4 times faster than developed countries. Finally, this weakens Korea’s competitive position in international market and individual property as well.

For these reason, renovation would be more suitable to develop a high-rise apartment complex in terms of money and time.

4 Miran Cho, 2000, A study on the planning methods for the remodeling of apartment housing, Residence Institute of The Korea Housing Corporation. pp. 13–18, translated by author
5 Yongmin Kim, 2005, A study on the comparison of feasibility between reconstruction and remodeling of apartment buildings, Sungkyunkwan University. pp. 95, translated by author
6 Hyunwoo Kim, 2003, A study on the planning methods for the remodeling of apartment housing, Sungkyunkwan University. pp. 9–10, translated by author
Chapter 2. Site background

2.1 Geography

Location: Eastern Asia, southern half of the Korean Peninsula bordering the Sea of Japan and the Yellow Sea

Geographic coordinates: 37 00 N, 127 30 E

Area:
- total: 219,140 sq km (84,610 sq mi)
- land: 213,004 sq km (82,241 sq mi)
- water: 6,135 sq km (2,368 sq mi)

Land boundaries: total: 238 km (147.88 mi)

Coastline: 2,413 km (1499.36 mi)
Climate: temperate, with rainfall heavier in summer than winter
Terrain: mostly hills and mountains; wide coastal plains in west and south
Elevation extremes: lowest point: Sea of Japan 0 m
highest point: Halla-san 1,950 m (1.21 mi)
“The Korean peninsula is roughly 1,030 km (612 miles) long and 175 km (105 miles) wide at its narrowest point. South Korea’s total land area is 100,033 sq km (38,622 sq mi), which is slightly bigger than Indiana (94,321 sq km), and it has a population of 49.8 million people (2011).”

South Korea is surrounded by sea in east, west and south and North Korea is located in the North. And, China is in the west of South Korea, Russia in the Northeast and Japan in Southeast. 70% of South Korea consists of mountains, and only 30% is plains. And granite and limestone based topography have formed various valleys and hills. Such geographical restriction increased density of population over the plain and high slope must be considered when housing site is developed.
## 2.2 Population Density

<table>
<thead>
<tr>
<th>Region</th>
<th>Population Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seoul</td>
<td>20382</td>
</tr>
<tr>
<td>Pusan</td>
<td>4497</td>
</tr>
<tr>
<td>Gwangju-si</td>
<td>2893</td>
</tr>
<tr>
<td>Daejeon</td>
<td>2806</td>
</tr>
<tr>
<td>Daegu</td>
<td>2750</td>
</tr>
<tr>
<td>Incheon</td>
<td>2591</td>
</tr>
<tr>
<td>Kyonggi-do</td>
<td>1148</td>
</tr>
<tr>
<td>Ulsan</td>
<td>1034</td>
</tr>
<tr>
<td>Kyongsang-namdo</td>
<td>298</td>
</tr>
<tr>
<td>Cheju-do</td>
<td>296</td>
</tr>
<tr>
<td>Chungchong-namdo</td>
<td>227</td>
</tr>
<tr>
<td>Cholla-bukto</td>
<td>211</td>
</tr>
<tr>
<td>Chungchong-bukto</td>
<td>199</td>
</tr>
<tr>
<td>Cholla-namdo</td>
<td>142</td>
</tr>
<tr>
<td>Kyongsang-bukto</td>
<td>136</td>
</tr>
<tr>
<td>Kangwon-do</td>
<td>87</td>
</tr>
</tbody>
</table>

Source: Bureau of Statistics, Ministry of Land  
*2010 (unit: person per sq Km)

The population density of Seoul, a location of target site has apparently higher than any other places. This is because of good accessibility to Seoul geographically and also of convenience of public transportation throughout the urban area. People tend to select in the urban area because of their job location and good accessibility. While some satellite cities were developed to solve dense population, it could not be the fundamental solution. Job location and accessibility are important factors for time and cost in residing in the city. Meanwhile, Seoul has various historic places such as Gyeongbokgung, Gyeongheegung and Changgyeonggung and also has representative cultural areas and facilities like Cheyonngyecheon, Insadong, Namsan and Sejong Center for the Performing Arts. Accordingly, it is essential to improve environmental quality of apartment, a representative housing type in Seoul to accommodate dense population in Seoul.
2.3 Neighborhood

"Seoul is divided into 25 gu (district). The gu vary greatly in area (from 10 to 47 sq km) and population (from less than 140,000 to 630,000). Songpa has the most people, while Seocho, the largest area. The government of each gu handles many of the functions that are handled by city governments in other jurisdictions. Each gu is divided into “dong” or neighbourhods. Some gu have only a few dong while others like Jongno-gu have a very large number of distinct neighborhoods. Gu of Seoul consist of 522 administrative dongs in total. Dong are also sub-divided into 13,787 tong, which are further divided into 102,796 ban in total."

Gangnam-gu, where the target site is located, has high education level and has the highest budget rate by tax compared with other Gu offices. Furthermore, the largest age group is 40s and 50s involved in active production activities. It makes them to recognize maintenance fee on their own residential environment leading to high opportunity of improving residential environment.

Geographical condition like many hills and mountains and rainfall play an advantage for creating space utilizing water.


Population by Age Group in Samsung-dong

Number of Days with Specified Weather

Source: Gangnam Statistics Service *2010

Source: Gangnam Statistics Service *2010

Source: http://gis.seoul.go.kr/
2.4 Land Use

AVERAGE GREEN SPACE
- Latin American Cities 255 sq m (2744 sq ft)/person
- African Cities 74 sq m (796 sq ft)/person
- Asian Cities 39 sq m (419 sq ft)/person

Source: The green city index, A research project conducted by the Economist Intelligence Unit, sponsored by Siemens

Surrounding areas of the target site are mainly commercial area and residential area. It is adjacent to Hangang River bank. Like other regions in Seoul Gangnam-gu has considerably lower green area with 100 sqft per person.
### 2.5 Parking

According to the statistical data of Gangnam-gu, 254,098 vehicles including cars, vans and trucks are registered. However the number of available parking lot in Samsung-dong Gangnam-gu is 219,635, which is insufficient. Sufficient parking space is crucial not only to the target area but also to local parking problem solution.

#### Number of Cars and Parking Spaces

<table>
<thead>
<tr>
<th>Type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Street Parking</td>
<td>10,890</td>
</tr>
<tr>
<td>Off Street Parking</td>
<td>15,523</td>
</tr>
<tr>
<td>Parking Lot at Building</td>
<td>193,222</td>
</tr>
<tr>
<td>Total</td>
<td>219,635</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedan</td>
<td>224,539</td>
</tr>
<tr>
<td>Van</td>
<td>10,161</td>
</tr>
<tr>
<td>Truck</td>
<td>19,160</td>
</tr>
<tr>
<td>Special Truck</td>
<td>238</td>
</tr>
<tr>
<td>Motor Cycle</td>
<td>15,074</td>
</tr>
<tr>
<td>Total</td>
<td>254,098</td>
</tr>
</tbody>
</table>

Source: Gangnam Statistics Service *2010*
2.6 Key Features

Total 61 high-rise apartments are located within 35 minutes walking distance from the target site with 18 schools, 3 shopping centers, 8 parks and 110 bus and subway stations. If external space of each apartment unit enables to provide green open space so that it can be transitional spots to key features or leisure spots, it is obviously a new paradigm green corridor. Currently, 36 apartment reconstruction works have been carried out in Gangnam-gu. If the plan of this project to accommodate the public into the apartment unit is accepted to other works, it could create an opportunist factor.
Chapter 3. Methodology

3.1 Questionnaire analysis

Location  Hongsil APT, Samseong-dong, Gangnam-gu, Seoul, South Korea
Period    12.29.2012 ~ 01.06.2013
Target    384 of households
Return Rate 38% (145/384)

As the result of resident survey, they took parking as the most serious problem, and types of outdoor activities were taking a rest and taking a walk. And they regarded apartment entrance, leisure/exercise space and pedestrian way as important spaces tool.

### RESIDENTS’ AWARENESS of OUTDOOR SPACES (unit: %)

<table>
<thead>
<tr>
<th>Most Important Feature for Outdoor Space in General</th>
<th>Most Lacking Feature for Outdoor Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking spaces 24.5</td>
<td>Parking spaces 21.5</td>
</tr>
<tr>
<td>Building entrance 20.5</td>
<td>Circulation 16.5</td>
</tr>
<tr>
<td>Play/exercise space 18.5</td>
<td>Open gathering space 15.2</td>
</tr>
<tr>
<td>Circulation 13.4</td>
<td>Resting space 12.2</td>
</tr>
<tr>
<td>Resting space 10.5</td>
<td>Apt complex entrance 10.2</td>
</tr>
<tr>
<td>Apt complex entrance 6.2</td>
<td>Building entrance 9.5</td>
</tr>
<tr>
<td>Open gathering space 5.0</td>
<td>Play/exercise space 7.5</td>
</tr>
<tr>
<td>Water feature 1.4</td>
<td>Water feature 7.4</td>
</tr>
</tbody>
</table>

### PRESENT CONDITION (unit: %)

<table>
<thead>
<tr>
<th>Average spending time in open space</th>
<th>Major open space activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 hr</td>
<td>Rest &amp; Walk 55.1</td>
</tr>
<tr>
<td>1 hr ~ 2 hr</td>
<td>Exercise 40.7</td>
</tr>
<tr>
<td>2 hr ~ 3 hr</td>
<td>Socializing 3.2</td>
</tr>
<tr>
<td>3 hr ~ 4 hr</td>
<td>Meditation 0.9</td>
</tr>
<tr>
<td>5 hr &lt;</td>
<td>Gardening -</td>
</tr>
<tr>
<td>etc. ( )</td>
<td>0.1</td>
</tr>
</tbody>
</table>

### RESIDENTS’ SATISFACTION STATUS (unit: %)

<table>
<thead>
<tr>
<th></th>
<th>Parking space</th>
<th>Play ground</th>
<th>Outdoor open space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Satisfied</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Somewhat Satisfied</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Neutral</td>
<td>0.2</td>
<td>2.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Somewhat Dissatisfied</td>
<td>12.5</td>
<td>4.2</td>
<td>13</td>
</tr>
<tr>
<td>Very Dissatisfied</td>
<td>87.3</td>
<td>93.3</td>
<td>77.5</td>
</tr>
</tbody>
</table>
3.2 Application of A pattern language by Christopher Alexander

3.2.1 Concept of pattern language

An environmental pattern design has to be based on people’s experiences and agreement because the physical environment is sharing by many people. This is the concept of pattern language compare the environmental pattern to language.\textsuperscript{9} Pattern language can therefore provide a useful basis for the design of the physical environment\textsuperscript{10}. The elements of this pattern language are entities called patterns. Each pattern describes a problem which occurs in our environment, and then describes the core of the solution to that problem, in such a way that I can use this solution. Just as words must have grammatical and semantic relationships to each other in order to make a spoken language useful, design patterns must be related to each other in position and utility order to form a pattern language. Alexander’s work describes a process of decomposition, in which the designer has a problem, selects a solution, and then discovers new, smaller problems resulting from the larger solution.

3.2.2 PURPOSE OF PATTERN LANGUAGE

There are two essential purposes behind this format. First, to present each pattern connected to other patterns, so that you grasp the collection of all 253 patterns as a whole, as a language, within which you can create an infinite variety of combinations. Second, to present the problem and solution of each pattern in such a way that you can judge it for yourself, and modify it, without losing the essence that is central to it. In the language, therefore, each pattern has to indicate its relationships to other patterns and to the language as a whole. This gives the designer using the language a great deal of guidance about the related problems that must be solved.

3.2.3 APPLICATION OF A PATTERN LANGUAGE TO THE SITE

All 253 patterns together form a language. They create a coherent picture of an entire region, with the power to generate such regions in a million forms, with infinite variety in all the details. It is also true that any small sequence of patterns from

\textsuperscript{9}Daesung Cho, 1983. Suitable for regional and environmental blueprint for the development of research, pp. 45, translated by author.

\textsuperscript{10}Rajinder Singh Jutla, 1993, Christopher alexander’s design theory from notes on the synthesis form to a pattern language. pp. 7
this language is itself a language for a smaller part of the envi-
ronment. Since Hongsil apartment complex is already built on
Samsungdong district, smaller scale of patterns will be applied
to this project.
<table>
<thead>
<tr>
<th>Patterns</th>
<th>Content / Method</th>
<th>Diagram</th>
</tr>
</thead>
</table>
| (25) Access to water | - People build places near water  
- The water's edge must be preserved for common use  
- The roads which can destroy the water's edge must be kept back from it  
- Treat natural bodies of water with great respect | ![Diagram](image) |
| (31) Promenade  | - Each subculture needs a center for its public life: a place where you can go to see people, and to be seen  
- Encourage the gradual formation of promenade at the center of every community  
- Link the main activity nodes  
- Put main points of attraction at the two ends to keep a movement | ![Diagram](image) |
| (37) House cluster | - Provide a cluster with group of houses: Public spaces are jointly owned by all the householders  
- Arrange the clusters - make residents walk through them without feeling like a trespasser | ![Diagram](image) |
| (59) Quiet back | - Residents can be protected from noise by building and walls  
- Build a path along this quiet back  
- A path is not a natural shortcut for busy traffic  
- Connect the path with other walks, to form a long ribbon of quiet alleyways | ![Diagram](image) |
| (60) Accessible green | - Provide green open spaces to go  
- Build open public green within tree minutes' walk  
- Make the greens at least 150 feet across | ![Diagram](image) |
| (64) Pools and streams | - Water plays fundamental role in our psychology  
- Residents need constant access to water  
- Make paths for people to walk along them and footbridges to cross them  
- Collect rainwater and allow it to flow above ground along pedestrian path | ![Diagram](image) |
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| (73) Adventure playground | - Set up a playground for the children in each neighborhood.  
- Provide raw materials such as nets, boxes, barrels, trees, ropes, simple tools, frames, and grass to create and recreate playgrounds of children |
| (75) The family | - Set up processes which encourage groups of 8 to 12 people to come together and establish communal households  
- Provide private realms for the groups and individuals that make up the extended family  
- Common space for shared function: gardening and child care  
- Provide a place where the entire group can meet and sit together |
| (88) Street cafe | - Street cafe provides a unique setting  
- Encourage local cafes to spring up in each neighborhood  
- Build the front of the cafe so that a set of tables stretch out of the cafe into the street |
| (97) Shielded parking | - Large parking structures full of cars are inhuman and dead buildings: conceal the structures because people don’t want to see them  
- The entrance to a parking structure is essentially the main entrance to the building: it needs to be visible  
- On ground level, the shield is important  
- Shops are useful: it generates their own pedestrian scale immediately |
| (98) Circulation realms | - Many building complexes have disorientation problem: people experience considerable mental stress as a result  
- It is possible to identify a nested system of realms in the complex  
- Each realm has a main circulation space, which opens directly from the entrances to that realm  
- The entrances to any realm open directly off the circulation space of the next larger realm above it |
| (104) Site repair | - Structure must always be built on those parts of the land which are in the worst condition  
- Consider the site and its buildings as a single eco-system  
- Build new structures in the least pleasant site now |
| (106) Positive outdoor space | - Outdoor spaces between buildings will not be commonly used  
- Make outdoor spaces which surround and lie between buildings positive  
- Enclose outdoor spaces with buildings, trees, hedges, and fences to make it an entity with a positive |
| (114) Hierarchy of open space | - Make a smaller space looking into it and forms a natural back for it  
- Make a larger space to be seen by the smaller space |
| (115) Courtyards which live | - Make every courtyard to have a view out of it to some larger open space  
- Connect the natural paths to the courtyard |
| (118) Roof garden | - A significant portion of urban surface consists of roofs  
- A roof take advantage of the sun and air  
- Make parts of almost every roof system usable as roof gardens  
- Make these parts private places with flat places to sit and sleep |
| (120) Path and goals | - Provide compatible path with the process of walking  
- Place goals at natural points of interest  
- Connect the goals to one another to form the path  
- Place the goals within few hundred feet |
| (126) Something roughly in the middle | A public space need something in the middle to escape empty atmosphere  
- The paths which cross a public square or courtyard or a piece of common land have something to stand roughly in the middle: a fountain, a tree, a statue  
- It can give a strong and steady pulse to the square and make people move towards the center |
| (129) Common areas at the heart | Create a single common area for every social group  
- Locate it at the center of gravity of all the spaces the group occupies |
| (134) Zen view | The zen view occurs in a famous Japanese house  
- Don’t spoil beautiful view by building’s windows  
- Put the frame to have the view at places of transition along paths |
| (161) Sunny place | Find a spot between building and outdoor spaces where gets the best sun  
- Develop this spot as a special sunny place and make it the important opens pace. |
| (171) Tree places | Plant trees according to their nature to form enclosures, avenues, squares, groves, and single spreading trees toward the middle of open space  
- Use the shapes of trees and buildings together to form places |
Chapter 4. Case study

4.1 District of “Sudliche Furth”

The district of “Sudliche furth” was built on the site of the former container goods railway depot in Neuss. The central location in the city is characterised by vitality and diversity.

Source: Basel, 2011, “Green living”, contemporary German landscape architecture, pp 34

Source: Basel, 2011, “Green living”, contemporary German landscape architecture, pp 35
4.2 The residents of the “Althoffblock”

The residents of the “Althoffblock” in Dortmund were involved in the design and planning of the courtyard garden. The result is green oasis of discovery that improves the residential environment and the quality of living.

Source: Basel, 2011, “Green living”, contemporary German landscape architecture, pp 37
4.3 Park Quartier Berg

The “Park Quartier Berg” urban neighborhood was developed by a group of architects and landscape architects and on a 1.5 hectare large site in Stuttgart. The design is informed by the urban landscape and topography. Clearly defined communally-used areas are provided alongside private outdoor space connected to the flats.

Source: Basel, 2011, “Green living”, contemporary German landscape architecture, pp 50-51
4.4 Interior courtyard of block 14, Loretto quarter, Tubingen

Band of planting create a threshold between private and communal green areas. The play area beneath the trees contains sand pits with a wet play area and wooden decking. The wooden walkway leads across the lawn to the adjoining communal terrace. By encouraging active participation in the design process, an attractive urban area has been created that accommodates diverse uses for a broad social mix of residents.

Source: Basel, 2011, "Green living", contemporary German landscape architecture, pp 97
4.5 Analysis
This analysis provide limited result from the data because those photos don’t show entire area of the site. However, it is useful to apply as an examples.
This analysis shows the raking which are applied into the cases.
1st, pattern 60 and 120
2nd, pattern 59, 106, and 171
3rd, pattern 31, 37, 129, and 161
4th, pattern 64, 73, 75, 115, and 126

<table>
<thead>
<tr>
<th>Patterns</th>
<th>Sudliche Furth</th>
<th>Althoffblock</th>
<th>Park Quatier Berg</th>
<th>Tubingen</th>
</tr>
</thead>
<tbody>
<tr>
<td>(25) Access to water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(31) Promenade</td>
<td>✔</td>
<td></td>
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<tr>
<td>(37) House cluster</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
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<tr>
<td>(59) Quiet back</td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>(60) Accessible green</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(64) Pools and streams</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>(73) Adventure playground</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>(75) The family</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>(88) Street cafe</td>
<td></td>
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<tr>
<td>(97) Shielded parking</td>
<td></td>
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<tr>
<td>(98) circulation realms</td>
<td></td>
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<tr>
<td>(104) Site repair</td>
<td></td>
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<tr>
<td>(106) Positive outdoor space</td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>(114) Hierarchy of open space</td>
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<tr>
<td>(115) Courtyards which live</td>
<td></td>
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<td>✔</td>
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<tr>
<td>(118) Roof garden</td>
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<tr>
<td>(120) Path and goals</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>(124) Activity pockets</td>
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<td></td>
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</tr>
<tr>
<td>(126) Something roughly in the middle</td>
<td></td>
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<td>✔</td>
</tr>
<tr>
<td>(129) Common areas at the heart</td>
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<td>(171) Tree places</td>
<td>✔</td>
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</tbody>
</table>
Chapter 5. Design proposal

5.1 Site Information

Hongsil Apartment Complex
Location  Samseong-dong, Gangnam-gu, Seoul, South Korea
Area    102.48 sq m(0.025ac) ~ 178.51 sq m(0.044ac)
Scale   384 of households / 6 buildings / 12 floors
Market Price  0.82~1.64(million)
Floor Area Ratio  193%
# of Parking Space  381
5.1.1 Site Change

It took not more than 30 years for Gangnam area to form all kinds of infrastructure and residential areas. Due to the unified plan of the time, there are many problems like parking and environmental problems at the moment.
5.1.2 Existing Condition
SLOPE CONTROL CONDITION

VIEW 3

VIEW 5

VIEW 7

VIEW 12

VIEW 13

VIEW 14

VIEW 26

VIEW 28

VIEW 30

CIRCULATION CONDITION

VIEW 9

VIEW 2

VIEW 27

VIEW 6

VIEW 38

VIEW 43
There are a lot of problems to the target site. The biggest problem is parking. Only 381 parking spaces are available to 384 households. Furthermore, the parking space design is not proper so that many have to park cars in slope or overlap. Sharp slope parking may cause safety problem in winter by snow or ice formation. Playground space is not properly maintained and has a risk of safety accident, which is not used at all now. For pedestrian way, it also has risk of safety accident as it is cut in the middle or has sharp slope. Furthermore, as there is no clear distinction in the apartment unit entrance, which is important for residents, it has problems in terms of external appearance and function.
5.2 Site Design

5.2.1 Diagrams
- Concept diagram

- Spatial concept diagram
- Vertical connection diagram

- Water flow diagram
5.2.2 Proposed Design

The development of target site needs to satisfy sufficient parking space and green open space at the same time so that residents might be supplied pleasant outdoor space for everyday life. In order to realize it in a restricted space, vertical development is planned. Furthermore, it is one of the methods for the maximum utilization of the difference of high elevation on the target site which was one of the problems of the site.

To overcome shortage of parking space and to utilize external space, 2 unused playground spaces except for 6 apartment buildings and 1 commercial building are selected for the development. As a result of the target site analysis, the size of these two sites are 83m(W) x 54m(L)
x 12m(H) and 83m(W) x 26m(L) x 3m(H) respectively having the difference of altitude with 12m and 3m respectively. Accordingly, after digging the ground of two playground sites, 4-story and 2-story building sites are secured. These buildings would play the parking lot and green open space role together, and walking trail will be constructed along with the apartment surroundings. The external space on the level 4, where pedestrians access through the commercial building, can also be accessed at the same altitude when approached from the south entrance. Accordingly, though this building is 4-story, it is recognized differently by the type of entrance. For the safety of the parking space in levels 1, 2
and 3, it is designed to attract sunlight as it stands and the surface of the level 4 is designed in a curve in order to make sure direct sunlight without interference.

The entrances of Hongsil Apartment are divided into two: one for cars and the other for pedestrians. The parking site entrance by cars is made through two spots, and there are 3 pedestrian entrances. Car entrance is controlled by the gate guard, and no access control is made to pedestrians. However, the entrance to the apartment building by pedestrians will be controlled by the guard in the level 1. Two places where playgrounds were placed would be the public space sharing with external public because of no pedestrian control. This is made possible by the fact that it could improve accessibility and convenience when accessing to the river park and other apartment units from important facilities such as adjacent schools or shopping malls, and that newly designed external space can be shared. However, the lower levels of apartment are blocked by planting trees in order to protect privacy. Garden and fitness center at the rooftop are semi-private space which are to be used exclusively by residents only through elevators of each
Floor connection & parking system

This project increases the number of parking space from 381 (0.99 per household) to 535 (1.4 per household) and enables effective external space.
Water from upper fountain creates water screen when it falls into the lower fountain to block views to parking space on the same level. Lower level of apartment units have their own front yard with full sunshine from cutting upper edge.
Biomorphic shape of top layer is designed to bring sunlight to lower level meeting the first floor of apartment units and represents water flow. Also it has sun exposure system and spiral stairs to bring sunlight into the lowest level of parking space for safety reason.

Service car entrance is provided from the parking space. The adventure playground is created with raw materials to recreate playground of children. Also, the sun exposure system is located in the middle of court yard for safety and aesthetic reason.
• View D

• Section E

• Section F
- View G - Vehicle Entrance
- View H - Pedestrian Entrance
• View I - Playground

• View J - Bench along the path
Chapter 6. Conclusion

Apartment complex is now became the representative housing type in Korea, but makes isolation between households and prohibits private exchanges causing a social problem of human alienation phenomenon unit for its simple and unified type in the past. Such problem was derived from the housing supply that stressed on the large quantity of households and basic maintenance along with the industrialization. But, thanks to the change and development of society, the value of residential environment has improved and advanced residential environment becomes essential. The change of qualitative life of residents and increase of leisure time has transformed the concept of apartment from ‘living place’ to ‘a place worth for living.’ If any redevelopment is made on the past unified apartment unit, spatial plan for activating community must be achieved. Improved economy lets people seek convenience and leads to the increase of car occupation. As a result, the volume of parking space in the past apartment is a problem that must be solved to improve quality of apartment units.

In order to solve such problems, this project extracted 22 patterns from Christopher Alexander “A Pattern Language”, and used those as a design methodology by means of various analysis of target place and questionnaire survey. Christopher classifies each pattern from regional
scale to a site specific of the target according to its flow.
As a result, design approach was available by applying various con-
siderations to each pattern as a language. For example, it was used to
define scope and factor system in the creation of external spaces for
community such as private space, semi-private space and public space.
As each pattern provides the basic concept comprehensively, pattern in
the design is engaged in the application of the concept. Thus, personal-
ity and creativity of a designer is needed for detailed design.
In this project, (88) Circulation realms, (104) Site repair, (120) Path
and goals and (134) Zen view were realized at large, and other patterns
were designed according to their characteristics at the different points.
Furthermore, as majority was used as parking space it was impossible
to make community space. Thus, parking space was allotted to the
courtyard and the above space was created a space only for pedestrians
separated from parking. As a result, it was made possible to extend
parking lots from 381 to 535, and accordingly, the 0.99 of parking
space per household increased to 1.4. As such, the parking problem
was solved and people could have improved external community space
at the same time.
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