LAYERS FOR COMMUNICATION

: low-rise, high density apartments in-between urban and suburban
Thesis submitted to the Faculty of
the Virginia Polytechnic Institute
and State University
in partial fulfillment of
the requirements for the degree of
Master of Architecture
by SeungJu Lee

_________________________
Albert J. Davis, AIA
Chairman

_________________________
William Brown

_________________________
Michael O’Brien

_________________________
Heiner Schnodt
<table>
<thead>
<tr>
<th>CONTENT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>04</td>
</tr>
<tr>
<td>Precedent study</td>
<td></td>
</tr>
<tr>
<td>Alvar Aalto</td>
<td>05</td>
</tr>
<tr>
<td>Herman Hertzberger</td>
<td></td>
</tr>
<tr>
<td>Renzo Piano</td>
<td></td>
</tr>
<tr>
<td>Peter Zumthor</td>
<td></td>
</tr>
<tr>
<td>Christian de Portzamparc</td>
<td></td>
</tr>
<tr>
<td>Henri Citteri</td>
<td></td>
</tr>
<tr>
<td>Presence in Korea</td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>15</td>
</tr>
<tr>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td>Definition</td>
<td></td>
</tr>
<tr>
<td>Space program</td>
<td></td>
</tr>
<tr>
<td>In between</td>
<td>21</td>
</tr>
<tr>
<td>Enclosure and order</td>
<td></td>
</tr>
<tr>
<td>Path</td>
<td></td>
</tr>
<tr>
<td>Division</td>
<td></td>
</tr>
<tr>
<td>Void</td>
<td></td>
</tr>
<tr>
<td>Sequences of space</td>
<td></td>
</tr>
<tr>
<td>Direction (Impulse)</td>
<td></td>
</tr>
<tr>
<td>Public domain</td>
<td></td>
</tr>
<tr>
<td>Journey</td>
<td></td>
</tr>
<tr>
<td>Movement</td>
<td>33</td>
</tr>
<tr>
<td>Layers</td>
<td></td>
</tr>
<tr>
<td>Transition</td>
<td></td>
</tr>
<tr>
<td>Dialogue between buildings</td>
<td></td>
</tr>
<tr>
<td>Unit language</td>
<td></td>
</tr>
<tr>
<td>Composition</td>
<td>52</td>
</tr>
<tr>
<td>Structural system</td>
<td></td>
</tr>
<tr>
<td>Balconies</td>
<td></td>
</tr>
<tr>
<td>Livingroom</td>
<td></td>
</tr>
<tr>
<td>Laundry room as a culture</td>
<td></td>
</tr>
<tr>
<td>Openings</td>
<td></td>
</tr>
<tr>
<td>Drawings</td>
<td></td>
</tr>
<tr>
<td>Isometric</td>
<td>65</td>
</tr>
<tr>
<td>Site plan</td>
<td></td>
</tr>
<tr>
<td>Floor plans</td>
<td></td>
</tr>
<tr>
<td>Typical unit floor plan</td>
<td></td>
</tr>
<tr>
<td>Sections</td>
<td></td>
</tr>
<tr>
<td>Elevations</td>
<td></td>
</tr>
<tr>
<td>Bibliography</td>
<td>79</td>
</tr>
<tr>
<td>Vita</td>
<td>81</td>
</tr>
</tbody>
</table>
Housing is one of the most fundamental subjects of architecture, not just for the basic purpose of shelter, but for the place where vitality can be transcended to the people living in them.

‘Housing’ rather than ‘house’ marks the intersection between architecture and urban design and the simultaneous existence of the individual and collective. Housing is also a form of material culture. As such, it cannot be understood without studying the cultural and economic conditions of its production. - Rem Koolhaas, ‘Conversations with students’

With the gradual change in family structure, housing accommodations would be smaller as the family size reduces, however, common open space and active recreation of all types would be enlarged.

This would be a greater opportunity to integrate urban with suburban environments - the town’s cultural and employment opportunities would be within easy access to the countryside and to nature.

“Architecture is an art filled with contradictions. The more we learned about these contradictions in architecture, the more they translate these contradictions into an antithesis: between discipline and freedom, between technology and environment, between modernity and tradition. But...discipline sets limits to freedom, yet it is also its container, the thing that gives it form. These two elements coexist and interact.” - Herman Hertzberger, ‘Lessons for students in Architecture’

The meaning of space can be clarified as dualities; between public and private, light and shadow, positive and negative, horizontal and vertical, man-made and nature, and denotative and connotative. Space is transformed into characteristic place through these changes, layers and sequences of movement.

It would undoubtedly guide urban growth toward a more humane living environment which can recover community space set against stereotypical architecture.
"The conventional apartment house is a sort of collective dwelling. It can never possess the same qualities as a private house, which has a direct relation to the landscape. Nevertheless, the private house, which is often placed as a box in a small garden without a protected interior court, has its negative sides. On the other hand, the apartment block can present some positive advantages. Therefore an attempt should be made to combine, in an ideal manner, the specific advantages of an apartment block with the merits of the individual house." - Karl Fleig, ‘Alvar Aalto’

In the Alvar Aalto’s apartment block project in Hansaviertel, Berlin, the conventional narrow balconies were transformed into an outdoor patio in which the rooms of each apartment were grouped around. This grouping around the ‘open-air’ room created an intimate and private atmosphere.

This subtle changes of movement in the balconies gives the building a dynamic sense of perspective. The entrance of apartment is well designed for an ‘open-air’ gathering place when people enter or leave. Each unit is placed in the central room with an ‘open-air’ balcony. The circulation between rooms is connected organically, it moves around the center without stopping, thus, using the small balconies of each unit more appropriately.

The apartment block in Hansaviertel, Berlin 1955 - 57
“The more influence you can personally exert on the things around you, the more you will feel emotionally involved with them and the more attention you will pay to them, and also, the more you will be inclined to lavish care and love those things around you. You can only develop an affection for things that you can identify with - things on which you can project so much of your own identity and in which you can invest so much care and dedication that they become part of you, absorbed into your own personal world. The more involved a person is with from and content of his surroundings, the more those surroundings become appropriated by him, and just as he takes possession of his surroundings, so they will take possession of him.” - Herman Hertzberger, ‘A+U’

“Everything is used according to one’s idea.” - Herman Hertzberger, ‘A+U’
"If the houses are private domains, then the street is the public domain. Paying equal attention to housing and street alike means treating the street not merely as the residual space between housing blocks, but rather as a fundamentally complementary elements, spatially organized with just as much care so that a situation is created in which the street can serve more purposes besides motorized traffic." - Herman Hertzberger, ‘Lessons for students in architecture’

The space in between apartments make a courtyard where the inhabitants could get involved with public life.

The street in-between apartments provides the space where people can get together as a public living room.
The complex has been divided up into a number of ‘wings’, each with its own ‘center’. The different departments come together in the central ‘common room’. This disposition of the spaces has resulted in a sequence of open areas which, from a spatial point of view, reflect the sequence: neighborhood center, community center, city center - a composite whole within which each ‘clearing’ or open area serves a specific function. Yet this pattern is dominated as it were by the central ‘courtyard’.

– Herman Hertzberger,
‘Lessons for students’
Renzo Piano’s international fairground building is located along a river and a park in Lyons, France. The urban significance of the intervention and the importance of the relationship with the river and the public gardens are evident from the outset.

The use of glass and terra-cotta has a strong and distinctive character. “The combination of the two materials produces a surprisingly blurred effect - a light and permanent vibration.” The reflections in the glass panels cause the variations of appearance in the depth, color, shadow, and direction of light.

The outer layer is composed of glass panels which manifest the double skin system. Some of these panels can be opened, turning on pivots. This increases the depth of communication between interior and exterior. A gap between the surfaces acts as a heat exchange, thus reducing heat loss.

“We wanted to divide the complex into homogeneous units, but to preserve the image and specific function of each; to guarantee the necessary formal unity, but to fall into the trap of uniformity.”

- Renzo Piano, ‘log book’

Cite Internationale, Lyons, France, 1991-95
Renzo Piano’s Rue de Meaux Housing project consisted of two hundred low-cost apartments in a heavily populated area of Paris. The inner garden is the central element and provides access to all the apartments. The relationship between the peace and quiet of nature inside the courtyard, set against the city outside and the idea of immaterial space is one of the critical points in this project.

“Even though this project had limited funding from public works, the project was successful in revoking obsessive repetition, an indifference to the surroundings, lack of taste, and character. Even with limited funds, the project produced homes filled with natural light, adequate landscape areas, and pleasant community spaces.” - Renzo Piano, ‘log book’

The contrast from the double skin wall system between the noise of the road and the silence of the courtyard, is a pleasant surprise. The visible element of the inner facades are square panels, detached from the wall. The double skin system is imparting a variety of reflected color and texture to the surface, creating a pleasing contrast with the rigorous geometric pattern of the facade.
Peter Zumthor’s Art Museum in Bregenz, Austria is a simple square translucent glass box producing subtle light and atmosphere inside the museum. This building is covered with hundreds of overlapping, opaque glass panels held by steel clamps in a slanted position, so that none of the surfaces touch the main structure.

“The curtain wall has finally been liberated from any dependency on the internal structure, and air freely circulates between the concrete structure and the self-supporting. The smoky translucency and skewed angulation of the glass panels make the cube a volatile presence. It constantly changes during the day according to the light, at times even seeming to evaporate. Inside, the power of the space offers a sense of sublime detachment from the world.” – Richard Ingersoll, ‘Architecture’ magazine, October 1997
The La Roquette Housing project in Paris by Christian de Portzamparc, used three fundamental archetypes determining the way we perceive space: placement and spacing, the center object and the void-volume, the place and clearing.

“The void is recognized as form, instilling the idea of hollow, inverse or negative spaces, which can be perceived as tangible. This tangible negative space idea is further accentuated by the rhythmic inclusion of the buildings, open at the corners and affording a maximum of light and views.” - Christian de Portzamparc, ‘Christian de Portzamparc’

“The city is becoming a succession of architectural units which are separate, autonomous, indifferent to place, isomorphic. Form is always determined by internal requirements and urban space. The outside is a secondary form, a backdrop against which objects stand out.” - Christian de Portzamparc, ‘Christian de Portzamparc’

With the strong conviction that the inhabited space would be informed, literally given form, by windows. The number and proportion are closely related. The proportion of a figure, its repetition and its number become blurred; the shift from the countable to the uncountable involves proportions.
The double height and full window of the building permits the entrance lobby of one building to create a continuously broad space perpendicular to the pedestrian route.

Bercy Social housing and shops, Paris, France

Even though the facade grid is rigorous, it does contain individual free forms, such as balconies, louvered shutters and bow windows.

Social Housing, Lognes, France

This small community room is used for collective activities.

Small rooms open into bigger ones in a fluid way assisted by the use of color and light around the themes of reflection, rough and glossy, bright and dark, thus creating a unified pictorial sequence.

"The greater the simplicity, the more varied and pleasing the result." - Henri Ciriani, "Henri Ciriani"

Charcot Social housing and shops, Paris, France

Henri Ciriani
Reckless design of collective housing has been a continuous problem. The shortage of construction time and financial problems from governmental agencies have worsened the situation. The house for habitation, has been considered in terms of increasing an estate(property) instead of supporting better life. Irresponsibly designed apartments are being cut like slabs of tofu, generating enormous concrete forests.

“Most city people live in apartments, and would not find it ‘city living’ to live in anything else. Indeed, much of the character that connotes a city derives from these distinctly and historically urban building types.” - Elisabeth Kendall Thompson, ‘Apartments, townhouses and condominiums’

1. Mixed use in historic area, Seoul, Korea
2. Typical mid-rise apartment buildings in Korea
3. Typical high-rise apartment buildings in Korea
Old and new, Seoul, Korea
Over the history of the development of new towns, urban forms were designed to meet varying needs, and the needs of production and environmental protection in the modern industrial era. As modern economies became overwhelmingly non-farm and urban, large and small cities face rapid expansion as the older and newly developing economies coped with the problems of housing and employing vast urban populations. The map on the left depicts the outward progression of satellite cities from the capital of South Korea, Seoul. Most of these cities sprang up during the early 80’s to fulfill the growing demand of a population and business boom. Due to the lack of road development on the northern part of Seoul, along with the fact of the proximity of the North Korean border, most satellite cities develop to the south of Korea. These expansions were easily facilitated due to the already established highway systems on the southern part. However, under the name of conventions for unification of North and South and all the supported business, this new towns have taken place.
This site is located in Il-san which is a new town suburb of Seoul, South Korea, which developed in the beginning of 1990. Due to growing population and expanding offices in Seoul, the government decided to design four new towns around Seoul between satellite cities which would accommodate housing and office buildings. The majority of these projects consisted of residential buildings, most of them are high-rise apartments and include supporting facilities. The chosen site is located almost in the middle of this new town which has very active pedestrian movement. Two blocks to the north and west of the site are the central core of the new town for public transportation, including a subway and all the supporting facilities. The chosen site is also surrounded by different zoning along a busy highway. The east side are single family housing blocks which are regulated up to two stories. The south side is occupied by a high-rise apartment block ten to eighteen stories on the right across the highway, the west side is five to ten story business block and on the north side there is also low-rise apartment block which is restricted up to three stories.
The zoning around the site

Zoning

Land development zoning in Il-san
Architectural trends are moving towards a placeless geography, a meaningless pattern of similar buildings.

“Globalization will pull all of us completely out of the ground and make us rootless. It will make us strangers everywhere.” - Rem Koolhaas, ‘Conversations with students’

The urban spaces should adopt a more relaxed and intimate scale, a desirable departure from the monumental and rigid forms of new town character. At this point in time what can be defined as the character in this new town? Everything is moving away from tradition, and moving towards a colorless ideology. We are standing in between technology and nature, and there is a task to make spaces better for communication between each other in public or private sector.
Prior to an explanation of the thesis project itself, an explanation of the title of the thesis project would help clarify the project as a whole.

The term 'multifamily housing', describes habitations in which three or more families live independently of each other in the same building. This building type includes multiple dwellings, apartments, buildings containing flats, and row houses that are on the same lot and are provided collectively with essential public services.

Rather than calling this project multifamily housing or collective housing it would be more specific to title it, 'low-rise apartments', designed for high density.

“The low-rise apartment building of considerable density has an urban character of its own, with its own kind and degree of amenity, from the interior court with its landscaping.” - Elisabeth Kendall Thompson, 'apartments, townhouses and condominiums'

Apartment;

Now that I have grown old, I have the feeling, when walking through a cemetery, that I am apartment hunting.

- Rem Koolhaas, 'S.M.L.XL'
This low-rise apartment complex consists of 43 units; 13 with one bedroom, 17 with two bedrooms and 13 efficiency units. The building form two angle shapes which have different lengths, formed as to embraced each other. The central space created by setting the two angle forms back from one another is to be a central activities area for all inhabitants. These would include playgrounds, water pools for children, sitting areas protected by landscaping and shaded trees. This central space is enclosed on the south and north side only, the east and west, are half open. The courtyard should convey the feeling as not to be completely closed in by buildings, but at the same time, gives a sense of protection and has stability in-between closed and opened space. Open spaces and closed spaces interact with each other in a concept of public and private spaces.
Between office building and apartments: road, trees and fence
Between single-family housings and apartments: road, trees and sub-entrance
Between high-rise apartments and apartments: highway, trees and noise screen
Between apartments and apartments: courtyard
Between units: staircase and community room
Between parking lot and units: community room
Between units and outside: balcony
Between rooms: columns and light

Space ‘in between’ always exists.
A building exists in-between earth and sky, and a space exists in between them.
“For space in the image of man is place, and the time in the image of man is occasion.” - Aldo van Eyck, 1962

Relationships between buildings and adjacent environments need to invite a spatial organization in which the built form and nature are not only analogous, thus responding to each other, but offer each other optimum accessibility.

“Each sentence derives its meaning from the words of which it is composed, while at the same time each word derives its meaning from the sentence as a whole.” - Herman Hertzberger, ‘Lessons for students in architecture’

This applies to everything in the world not just in a building. Each room has its own meaning and purpose, when they are connected together in an appropriate manner, we can recognize as a whole not just as a cell.

“In fact, each architectural assignment contains an incentive to develop a new order, an order emanating from the specific nature of that assignment. Just as each order represents a specific mechanism, it also tends to be exclusive to that mechanism. Different aims are emphasized in different instances, but the central issue with structure is the paradox of an ordering creating freedom - a horizon throughout your plan.” - Herman Hertzberger, ‘Lessons for students in architecture’

The building order of this project is accomplished through a profound realization of the uses with an understanding and embracing of the surrounding environment to which it will be set against.
The building as a whole has different characteristics between the front and back of each unit, but it becomes unified when those units encounter each other.

There is a path which connects these two different spaces.

“The concepts ‘public’ and ‘private’ can be interpreted as the translation into spatial terms of ‘collective’ and ‘individual’.

The unity that arises in a building when the parts taken together determine the whole, and conversely, when the separate parts derive from that whole in an equally logical way. The unity resulting from design that consistently employs this reciprocity - parts determining the whole and determined by it - may in a sense be regarded as a structure.” - Herman Hertzberger, ‘Lessons for students in architecture’
I have often reached the threshold of the temple, but I have never gone in, such is the inadequacy of our hands in comparison with the force of our ideas. You cannot enter the temple, no one can. And it is no good seeking an unattainable perfection: perfection kills research, and kills architecture. — Norberto Bobbio

“We move through space and time; we experience our surroundings through our bodies and, by our mere presence, impose a schema on space whether we are aware of it or not.” — Tuan, 1977

“Permitting ‘building’ and ‘street’ as spaces with different degrees of public accessibility to penetrate each other in such a way that not only the border lines between outside and inside become less explicit, but also that the sharp division between private and public domain softened.” — Herman Hertzberger, “Lessons for students in architecture”

“Warp and weft: the warp may well serve to keep the whole fabric together, but the appearance of the end-product is still determined by the weft.” — Herman Hertzberger, “Lessons for students in architecture”

From public to limited public
From limited public to semi-public
From semi-public to semi-private
From semi-private to private

Journey from street to each unit
by foot:
- street - main path under the bridge - water fountain - main plaza - sub-path - staircase - community room (gathering place or coin laundry)
- each units
by car:
- street - ramp - underground parking lot - light box - staircase - community room - each units

From vertical - diagonal - horizontal

Path exists in between public and private space. The path is not just between residual space but fundamentally complementary elements when it is spatially organized. The situation is created in which the street can serve more purposes.

1. Space division (center is the heart - water)
2. Passage - one unconnected main and one horizontal sub passage
3. Connection and implication
4. Green space along the site
Various changes of open space

Exterior space changes from narrow path to wide plaza. It embraces from outside of site to enclosed space inside. Place is defined through the depth and layers of spaces. There is the sky, people always can be looking out of various frames. The void space which is opened to nature is folded with time. Through the changes of time, this open space is filled with the diversity of shadows from the apartments. The open space with absolute light and shadow becomes a whole embraced place where people enjoy their public life.
There is an implication of space. Looking at the front of the building from a far is one of the consequences of movement and differences in scale. Looking at the building within nature, not just building itself, and walking along paths crossing between light and dark, wood and stone, and between columns, people could recognize an axis in space. These contradictions of light and columns arranged in rows have depth of space and time and inform the people directly and indirectly.
From the path to each unit, there are staircases for each apartment. They are inviting people to the inside. Main balconies are facing to south. Since living rooms are one of the most used spaces in the house during the day, the adjacent balcony allows more light to the living room. Thus, it makes the living room close to nature and draws it away from public contact. All balconies off the living rooms are facing south and all balconies off the laundry rooms are facing north. It relates the importance of light from the south in a traditional way.

The formation of community and the cultivation of communal senses are the tasks in the development of collective housing. The rupture of interchanging between neighbors, individualism and inhumanism are always the object of continuous criticism in collective housing. Collaboration in urban places are not needed as much as in rural areas. Rather than collaboration, the concept of mutual defense is a prevailing phenomenon in urban areas. The ‘in-between’ situation in a suburban site needs to fulfill both protection and collaboration.
A street exists in-between public and private space. This may also be shown in-between central courtyard and apartments. The street is not just between buildings but the space where people can expand their public life and communication with each other among all kinds of possible activities.

The space in between apartments could be either static or active, green or paved, or having both characters. However, in each case, the public space has to be personally responsible for an environment that the community can relate to and identify with. In each case the function decides the right proportions of the space.

“The dimensions have to match what is going to take place there (or conversely, what goes on there has to match the dimensions). We must see to it that the dimensions of space, large or small, are appropriate for the functions they may be expected to serve.” - Herman Hertzberger, Lessons for students in Architecture

Road as a public space

Use of public court between apartments in Japan

Public court between apartments in France - Henri Ciriani, 1985

Public domain
"A street area with which the inhabitants themselves are involved and where individual marks are put down for themselves and for each other is appropriated jointly, and is thus turned into a communal space.

The more responsibility users have for an area - and consequently the more influence they can exert on it - the more care and love they will be prepared to invest in it. And the more suitable the area is for their own specific uses the more they will appropriate it. Thus users become inhabitants.

There is significant difference between the meaning of a word 'user' and 'inhabitant'. The user is just a person who uses a subject for specific reason but an inhabitant is a person who lives near, taking care of the space, and having social interaction. Belonging to either the private or the public domain are equally accessible to both sides, that is to say that it is wholly acceptable to both that the 'other' makes use of them.

If you provide the proper spatial suggestions into a design, the inhabitants will be more inclined to expand their sphere of influence outwards to the public area. Even a minor adjustment by way of spatial articulation of the entrance can be enough to encourage expansion of the personal sphere of influence, and thus the quality of public space will be considerably increased in the common interest." – Herman Hertzberger, 'Lessons for students in Architecture'

LiMa Housing, Berlin
The courtyard’s open space is composed of different volumes and expressions, most of these expressions are dual in nature. The volumes are high and low, compressing and expanding, calm and in tension. The planes of the structure are also opposing forces, with vertical and horizontal elements adding to the entire scheme.

“The courtyard contains a manageable canvas, makes finite external world, provides another space between ‘in’ and ‘out’. The ultimate challenge is to keep such a space neither ‘in’ nor ‘out’.” - Stephen Matthias, “Courting the house”, JAE fall 1988

sketches of the courtyard
natural path
center
different domain by inhabitants
green space
**Layers for Communication**

**Entire site**
- public - limited public - semi-public - semi-private - private
- street
- path
- corridor
- front or rear garden
- community-room
- indoor - parking
- each unit

**Unit**
- public - semi-public - semi-private - private
- entrance (front door)
- living room
- kitchen and dining area
- balcony
- laundry room
- living room balcony of laundry room
- bedroom
- bathroom

Movement
Number map for computer graphic images

Ten story office building
There is a contrast when people enter the apartment complex. Light and dark, open on right hand side, closed on left hand side by trees. There is a bridge in front of the entrance connecting two apartments, composing the main entrance gate. Little bits of panoramic views can be seen through this bridge, limiting the whole view. Inhabitants who pass through this main entrance experience the intersection of light and shadow, or opened public to limited public. To enter this gate means naturally to enter a different province. Differences in heights in the entrance, three stories on the left, two storied columns on the right, contribute to the exceptional language which convey the concept of entrance. The result of this main entrance was realized under the consideration that a ten story office building abutted the site. More open space around the area was needed. The adjacent open area between the office building and apartments would be used for parking and a playground.

Perspective models show the limited view through the movement.
There are trees, sky, and two water pools... closed spaces and open spaces. People can feel the aura of the natural environment even though this site is located in an urban area right next to a busy highway. From the noisy road to the inside of the courtyard of this apartment complex, there is a dramatic difference between the two worlds.

“When the process of concept formation is seen in all its complexity, it appears as a movement of thought within the pyramid of concepts, constantly alternating between two directions, from the particular to the general, and then from the general to the particular.” - Vygotsky, ‘Thought and language’
There is a path adjacent to the single family housing block. Among the four sides of this site, there is one main entrance and two sub-entrances connected with the streets. Every passage has a different character. The path which has a long horizontal line is straight from the intersection of the other two paths. There is a water pool and beyond there is a concrete wall. This path is recognized by lining up in 4 files of trees. These trees provide shadow in the summer, and more importantly hinder onlookers to the inside of the units. The elements contribute to privacy, shaping of shadows, and patterns to two symmetrical apartment buildings. This narrow path between the trees makes the path with endless thoughts.

Traffic free... water... trees... sky...and human being
This apartment complex is composed of repetitive of different horizontal walls. From the south side (highway) to the north side (rear street), the layers of exterior horizontal walls are symmetrical except where the glass noise screen is on the highway side. Each side and center parts are opened to nature with elements such as water, grass and trees.
The space in-between each walls contains various atmospheres. The brick is used as the main material for its softness and changing light through each of the stacked layers. The concrete is used as another main material for load bearing walls, exposed walls, beams and slabs. These two materials are used for contrast in texture, color and flexibility. This system can be compared to the human structure. Bones for concrete, skin for brick walls, blood vessels for interior corridors and clothes for glasses.

Each component has its own character and when everything is put together, it becomes one system. Each wall relates to one unit, and one unit relates to the entire apartment complex.

Through the layers of different walls, there are different lights, spaces and time. People can breathe fresh air and feel, and enjoy the space. When every wall has its personality and function, a wall becomes the WALL.
Layers - space between Noise Screen and Exterior walls

- outline of brick wall
- space changes between noise screen and exterior wall
- extended balconies from living room
- balconies from each living room
- balconies from each bedroom
- steel structure for screen
- brick wall outside of den
- brick wall and concrete columns outside of dining room
- brick wall outside of living room
- brick wall outside of bedroom
The glass wall reflects noise. It increases the depth of communication between interior and exterior. A gap acts as a heat exchange and air buffer, accumulating heat in the winter. It is also the division between outer and inner space.

Two opposite materials which are clear glass and brick produce an effect of light and reflection with variations.
Layers - noise screen

Elevation study of glass wall
The south side walls of glass and brick make a wave of movement through the changes of shadow and volume.

The inside of each unit on the south side are the living and dining areas. There are balconies which have substantial views. This long glass noise protection wall is designed of simple, clear and transparent elements. It is comprised of a different language that of the apartments. It does not block any views from the outside or inside, but only noise. The noise wall is a separate structural system made out of steel and clear glass, forming the first layer of this site from the highway.
Model study of noise screen

From highway to green buffer zone
From green buffer zone to glass noise screen
From glass noise screen to steel frame
From steel frame to concrete beams
From concrete beams to brick exterior walls
From brick exterior walls to balconies
From balconies to inside of units

Through the changes and movement of layers, unique space is created. The space in-between glass noise screen and brick exterior wall is opened, so that a more natural way of approach instead of a man-made one is allowed.

The transparency of the noise screen gives the space in-between the noise screen and the brick wall, more depth and reflection.
TRANSITION:
1. a passage or movement from one state, condition or place to another
2. a movement, development, or evolution from one stage, form, or style to another
3. a passing from one subject to another especially without abruptness
4. a sudden change of key
5. a musical passage leading from one dramatic scene to another usually by fade, sound effects, music, or narration - from 'Webster’s international dictionary'

Like the semantic ways of transition, the space of transition includes the changes from one to another not only with material elements, but also immaterial elements, such as light, transparency, vibration, texture and color.

The in-between space changes the action softly and naturally and can arouse emotions by creating dramatic spaces, serene spaces and participatory spaces, which are linked to the function and use of the setting.

Transition = neutral = in between
It is like the color gray.
The act of transition always happens. The space for transition can be recognized by movement, natural light, or visually, through the use of different materials.

“Space is transformed into marked and delimited place which is resonated with environment and experience.” - Christian de Portzamparc

However the space of transition can be read without limit because it is the space in-between and often endless to the open sky.
Water
Contributing to the natural state of the courtyard

“Psychological space is at the core of spatial experience. It is intertwined with the subjective impression of actual spatial geometry and born in the imagination. The absolute side of rational planning is in a contrapuntal relationship to the pathological nature of the human soul. It is in this mix, at its architectonic conception, that the spatial spirit of a work of architecture is determined.

Sitting in a fishing boat, drifting a few miles away from the ocean shore, one is surrounded by horizon. Reflections of clouds in the water double the space of the sky; the ocean provokes a silent, inward-focusing mood, psychological as well as spatial.” – Steven Holl

‘Edge of a city’
Light leads the people inside to each unit or community room. The entrance of the staircase implies the inside of the building.

Different than the whole structure of the apartments, the staircases have an exposed concrete structural columns and covered with transparent glass. It is distinguished clearly by transparency and maximum of light.
“It is used by some as an open hallway, into which the atmosphere of the home is allowed to penetrate. It can be also locked and lead to the actual staircase, so that an closed but open connected entrance is obtained. This intermediary space between staircase and front door is interpreted differently by different people not exclusively as part of the stairs but equally as an extension of dwelling.” – Herman Hertzberger, ‘Lessons for students in architecture’

The threshold provides the key to the transition and connection between areas with divergent territorial claims and as a place in its own right. It constitutes the spatial condition for the meeting and dialogue between areas of different orders.

Half-open entrance with two front doors, one after another, shows the communal territory of the inhabitants.
Dialogue between buildings
When a room is touched by air, that exterior surface can breathe through louvered openings, large or small windows, shaded openings or completely open designs. There is a dialogue between a person inside and outside of the room. Direct contact with each other is possible as in the case of drawing number two. Underneath the rear balconies, the space is used for hanging laundry, it is also used for ventilation of the underground parking lot. Because of the difference in levels from ground to unit, people in the plaza cannot look inside of the rooms. The bedrooms located on the plaza side are recessed and have green space in between the plaza and bedrooms, keeping the bedrooms more private. All of the balconies in the first floor have screens that prevent one from looking over or are connected to fenced green space, to make a distance between rooms and outside.
Typical unit plan for apartments in Korea
The division of space of each room for one and two bedroom units

Starting from rectangular shape then deconstructing it. Each room has its own space divided by separate walls. Every room is circulated by the central location of the living room which is connected to the balcony. Every room has its own window for ventilation and light. The spaces that have water are the kitchen, bathroom and laundry room. They are connected next to each other to make plumbing easier and to simplify the construction.
1. entrance
2. living room
3. bedroom
4. kitchen
5. dining room
6. bathroom
7. laundry room
8. family room
9. stairs

Typical unit layout
These typical floor plans are duplicated in the entire apartment complex, except with minor changes depending on the location. The one and two-bedroom units and efficiency, all have staircase. Primary vertical walls are poured concrete for load bearing, and give the room possibility of expanding in two ways, giving freedom to allow light through gaps in-between the two walls. The concrete walls inside the units are exposed for emphasis and to penetrating light and for texture. Partition walls are variable to accept openings and enclosure.
“My sense of wall was no longer the side of a box. It was enclosure of space affording protection against storm or heat only when needed. But it was also to bring the outside world into the house and let the inside of the house go outside. In this sense I was working away at the wall as a wall and bringing it towards the function of a screen, a means of opening up space which, as control of building material improved, would finally permit the free use of the whole space without affecting the soundness of the structure.” — Frank Lloyd Wright, ‘An autobiography’
How can the balconies and rooms meet “open-air”? Extruded balconies give the exterior various subtle changes. Direct contact with the living and dining room is the most critical point.

Expansion from the living room, on the same level, increases the feeling of more open space making the one room when the door is open feel larger.

Looking out from living room - 1

Looking out from living room - 2
“There was daylight coming from the square opening above the front wall, which balanced the artificial light. The sky that we could see was like a surface which appeared as a solid blue material, but at the same time empty. The color was not one seen in paintings; it was material and immaterial at the same time. ...After awhile the blue became darker and stronger, and the space inside the opening receded and gained depth .... The sky became pale blue and lost its depth, appearing again like a surface painted with a light color, something solid and ready to come out of a frame .... Different colors began to appear in a slow but steady succession .... We realized that night had arrived.” - James Turrell, “The art of light and space”

see
feel
recognize
understand

Each step has its distinctive ways of movement.
"One of the difficulties of using light is that there isn’t yet a tradition of using it in our culture. On the other hand, it is no more unusual to use it than to use stone, clay, steel or paint. These are materials that you honor, and to that degree I was interested in using light as material - not light in glass, screen, or plexiglass, but light in the space itself and the qualities of space - making light without traditional physical form. There is a rich tradition in painting of work about light, but it is not light - it is the record of seeing. My material is light, and it is responsive to your seeing - it is non-vicarious." - James Turrell, 'The art of light and space'

Computer renderings of one unit show the contrast between light and dark, horizontal and vertical line and, wide open space and narrow view through columns. Recognition of the space through the light.

columns...
light...
shadow...
concrete wall of one vertical side...

comfortable space...
timely space...
image...

The center of the house
The balcony on the courtyard side, has the dual purpose of hanging laundry and communicating with the outside. The openings on the balconies are half-louvered and half-open, allowing both functions of laundry and seeing possible.

Gioggia, Italy

Laundry room

1970, Seoul, Korea

The expansion of private space to public space.
Plan

"The elements are in principle freely chosen, but of course in such a way that the description becomes convenient." - Norberg-Schulz, 'Intentions in architecture'
Prototype of windows

Depending on the room, different types of windows were constructed to fulfill both light, ventilation and views.
Typical unit floor plan

- 1 bedroom unit
- Staircase
- Efficiency
- 2 bedroom unit

Layers for Communication
LAYERS FOR COMMUNICATION

Sections

DRAWINGS

A  B  C  D

8  7  6  5  4  3  2  1

A  B  C  D

↑  ↑  ↑  ↑  ↑  ↑  ↑  ↑
L A Y E R S F O R C O M M U N I C A T I O N

Horizontal sections
LAYERS FOR COMMUNICATION

Vertical sections
Elevations - front and rear
L A Y E R S F O R C O M M U N I C A T I O N

- Frank Lloyd Wright. (1943) ‘An autobiography’, Sloan and Pearce
p.05 Karl Fleig. (1963) ‘Alvar Aalto 1922-1962’
p.06 Herman Hertzberger. (1980) ‘A + U’
p.31 Herman Hertzberger. (1991) ‘Lessons for students in architecture’
    bottom left - Herman Hertzberger. (1991) ‘Lessons for students in architecture’
Seungju Lee

Bachelor of Architectural Engineering
Myong-Ji University
Seoul, South Korea
February, 1993

Master of Architecture
Virginia Polytechnic Institute and State University
Blacksburg, Virginia, United States
November, 1998

Institute of Traditional Korean Architecture
in Myong-Ji University
Seoul, South Korea
May, 1991 - December, 1994

Won Engineering
Seoul, South Korea
January, 1995 - September, 1995
To Albert J. Davis for the discreet directions and investigations into an essence of architecture

To William Brown, Michael O’Brien, and Heiner Schnodt for endless discussions and encouragements

To Jorge del Castillo and Jennifer Reymundi, my closest friends and studio partners, for all suggestions, care and generosity

To my parents and husband for the enduring love, endless support and allowing this time in Blacksburg

I dedicate my work with tremendous love and appreciation to my parents and husband.