GRADUATION MASTER THESIS

URBAN FILTER ON THE BORDER

GRADUATION SPECIALIZATION: HYBRID BUILDING (BUILDING TYPOLOGY)
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Introduction

The objective of this studio is how a single building can act as an urban design by taking specific urbanistic gestures in the situation that urban development has been traditionally chaotic and less planned in the absence of an over-all urbanistic plan, Deurne in Antwerp. So I have sought that among isolated urban fragments, a public building should acquire meaningful urban configuration by putting a stimulus for recombining urban fabric. The working process from urbanistic reorganization in the area (between Rodekruisplein and the existing district house) to architectural proposal is the process to testify studio’s hypothesis that the design of a single public building can perform as an urban design.

1. problem statement & proposal on urban scale (the area between Rodekruisplein and the existing district house)

1.1 Lack of quality & quantity of public space

The concern of this project on urban scale starts from the use of public spaces on the area between Rodekruisplein and the existing district house. Because we can trace the difference from other areas, distinct culture and identity through seeing uses or sceneries of exterior spaces which people shares with neighbors on local society. Especially one of impressive places personally is the narrow alley which is arranged perpendicularly to the direction of the public park (Rivierenhof) on the southern part from the Turnhoutsebaan. People use narrow alleys as an urban livingroom sharing with neighborhoods. By each houses’ household items coming out of houses, some of them are used as a public bench for meeting neighbors and those are used as expression tools of local community by various ways of decoration or gardening in front of each houses. If we see the condition which they can stay with feeling comfortable in the space of alley, one of factors is related to good human scale which is comprised of appropriate height and width of surrounding buildings and proper enclosed space. That is to say that those alleys are working as a lively well-used public space for the local society autonomically within the given environment.

In contrast, if you try to find another well-used public space except the public park (Rivierenhof), it is hard to discover those kinds of spaces in urban fabric. Some appropriate places for a public space are being used as a parking lot. And there are many abandoned lands especially on the edge between residential area and authorities (police station, the district house). Because of that, even the accesses to the public park which has a role for local life in North Deurne are almost blocked.

By summing analysis up, it can be judged that the circumstance which has lack of public spaces in good quality within residential region leads to which local people makes their own exterior spaces on those alleys.

Kevin lynch (Urban theorist and planner in USA) says that the small-scale public space in a city located within ten-minute distance on foot from living space is related to vitalization of local community and so it can be recognized as residents’ own exterior spaces, and so the privacy of small groups can be assured. And he added that with activities such as taking a rest, taking a walk, meeting, it gets settled as a daily life space.

To revitalize retired environment for pedestrian under dominant car environment in north Deurne, we can know that it is very important to enhance the quality of public spaces and increase various public pocket spaces in residential area.

1.2 Reorganizing with various public spaces & Connection with landscape structure

One of potentials on this area is that it is enclosed by green structure. The green structure surrounding half region of North Deurne continues to the site (Rodekruisplein). This green structure with the stream (Schijn) provides leisure network such as museums, sports clubs, cafeterias and the public park to local residents. So accessibility and continuity to the green structure is quite important in a radius of their living. Therefore it can be a good element to reorganize urban fabric by making connection into green structure through narrow alleys on north-south axis and east-west axis.

Simultaneously to get rid of blocked edges towards the public park because of authority buildings, I needed to rearrange programs in urban fabric for reorganization as well. I changed police station into children library which belongs to adjacent primary school and I inserted new kindergarten in same block. Hence the backyard which is abandoned can be vitalized and the access to the park can be facilitated on both alleys. Meanwhile in other area, I added new houses to revitalize abandoned site. These processes make local people use these alleys and the park more lively and easier, and it will lead for small public pocket spaces to be used for their own community space along these alleys.

1.3 conclusion

As concluding remarks on urban proposal, several scales of public spaces should be made functioned with optimized quality of exterior space to revitalize local residents’ environment on Deurne city scale. Like the alleys as a representation of private-life and the park as a public space on the scale of the whole agglomeration of Antwerp, residual spaces should be composed as the elements which can produce right scale of public spaces in good quality and which can reintegrate surrounding urban structure.
Such the urbanistic attitude is continued to architectural proposal in Rodekruisplein.

2. problem statement & proposal on architectural scale

2.1 Urban islands
The site (Rodekruisplein) is not only on administrative boundary of Deurne but also on the border of contrasting physical condition (high-rise apartment on the west and low-rise urban fabric on the east and south.) After the World war, Antwerp started to have city extension out of former city wall in earnest. Then one of main issues was how to develop huge orbital empty spaces made by getting rid of city walls and moat, including with infra-structure. Along huge scale of highways and railroads connecting EU, various group of high-rise buildings which were different from existing type of buildings and urban structure were designed and people desired new suburb modern life within new urban images. But in reality, a few of high-rise buildings were realized along the highway and those are remained as fragments. Under above history, the creation of high-rise apartment next to the site can be understood.

In addition, Antwerp has been formed mixing new buildings only for economical issues with historical buildings non-contextually, instead of organized urban design and consideration of various level of public spaces.

In the same flow, the situation near site has the similar case which different character of buildings stand separately and in isolation. On the east side of site, the church which was the root of old center in Deurne and built in sixteen century is only open towards cemetery with fencing in the yard to all sides. On the north side of site, the priest house which is the highly profiled historic architecture and has a beautiful private garden is enclosed by high walls for requiring privacy. On the west side of the site, two apartments stand with overwhelming height and width in a close distance. On the south side of the site, three storys' buildings face with the site at the back and with the walls for backside privacy.

As can be seen above, adjacent objects in all sides from the site exist without any relationships among them separately and so far high walls to three directions have decided their relations desolately and ambiguously.

Under current condition, to make new center space of retired north Deurne, my point of view is that the site which exists as the isolated urban island should be reorganized and connected with separated existing objects and the condition of landscape, and that new masses as urban artifacts clarify the characteristics of each exterior spaces and provide public space where people want to stay, with respect to each requirements of adjacent buildings for their own characters and privacy at the same time.

2.2 Urban filter on the border

2.2.1. programmatic strategy
For the site to have an important role as a new center in deurne, it has to be able to provide various size of multi-purpose spaces which can accommodate needed activities for local residents as community center, in connection with public exterior plaza synthetically, instead of offering individual supporting programs. In addition, that community center would be combined as a central public building with the library which will be the knowledgeable supporter for local people and the health care center which will help health management.

2.2.2. formal strategy
At present, the stream (Schijn) next to the site has a role as a physical border to divide two areas between the apartment area (the private residential area) and historical area on the ground level. But the apartment itself is too overwhelming in a visual way from the site because of physical height and width. Vertical private space in the apartment area and horizontal public space which I intend to develop on the site require for each spatial characteristics to be protected by visual protection.

In other words, it is crucial through three-dimensional consideration, which gestures new masses have as a mediator or a transitional object to provide good public spaces with integrating surrounding conditions. Proposing masses work as 'urban filter' to keep contrast spatial characters (public plaza and private residential area) distinctly. At the same time the public space is continued with penetrated inside space through the mass to the waterside on the ground level and so natural environment can be experienced in the public backyard.

Specific spatial realization follows,
Firstly, public open plaza can be comprised in connection with historical monument as a center. Because church itself has strong visual attraction and if it is combined with public programs and spaces, it can have the synergy effect. At the same time, the church which is seen from the public plaza can remind people of meanings as a historical memory. For the specific realization, I made continuation spatially from churchyard, public plaza to waterside, public plaza.
Secondly, for comfortable public open space, visual protection from apartments which have dominant scale and private living (building and garden) is needed through a paralleling mass with apartments. Kevin Lynch says that transitional spaces help to understand different characteristics between contrasting spaces and that such a divided environment makes spaces protected and not separated definitely at the same time. And also we could know the importance of humane scale and appropriate enclosed space for public space from usage on narrow alleys in the beginning. By former process, we can make clear of spatial characteristics from public to private area in several layers.

Thirdly, for access to the green structure which was already emphasized above, and for providing two entrances from both west and east sides (from high-rise residential area (west) and from low-rise residential area (east & south)), the public plaza is placed in the middle of the site. Public rooms, public programs on the ground level would have direct relationships with the public street and so pedestrians are attracted to use facilities in community center naturally.

2.2.3. space and program composition

I propose two new masses and one renovated priest house. One is the vertical mass to respond the apartment to form the public plaza and the other is horizontal mass to be continued in existing urban fabric with forming the public street. And the priest house which has existed separately is drawn positively to make it play as one of urban artifacts by involving the program of community center, temporary daycare center.

Public programs for community center such as public rooms (multi-purpose spaces), gym, cafeteria are placed closely with public street and public plaza to have direct relationships on the ground level. And the library is located on the vertical mass because it has semi-public spaces and it can be worked as a mediator between public plaza and vertical private area (apartment) from first floor to fourth floor. And because health care center asks to have some private spaces in specific functions, it is placed which is open to private backyard on first floor in horizontal mass.

Concerning public plaza, to maximize comfort on public plaza with making enclosed spaces and temporarily to be used as exterior theater for regional summer events, I propose the public plaza which has a slope by 1.2m in keeping continuous space from the church to the waterside. This not only provides spatial stability apart from the car road and but also makes increasing the accessibility from the public plaza to waterside spatially. Especially through leveling down, it limits the public plaza into the size (23m~28m) and appropriate spatial scale makes people have active communication on that. Jan Gehl (Danish architect) says, regarding distances and communication, “At a distance of approximately 30 meters, facial features, hairstyle, and age can be seen and people met only infrequently can be recognized. When the distance is reduced to 20 to 25 meters, most people can perceive relatively clearly the feelings and moods of others. At this point, the meeting begins to become truly interesting and relevant in a social context. A related example is the theater…”

In continuation with the public plaza, I propose vertical public space inside. This comprises of public atmosphere three-dimensionally and so it makes the public plaza work more variably and actively. The users on floated foyers can have interaction with people on the public plaza and can see the city view on high level by providing architectural promenade continued from the park. At the same time, it protects library’s silent atmosphere through providing transitional areas against public plaza and provides efficient internal connection for library users.

Regarding public rooms, same group of spaces could host several separative programs supporting the variety of activities needed in local community society. Sometimes these rooms can be supported for the events on public plaza. In addition, there are multi-purpose public halls. Those do the role as main hall in normal time and when it is needed for small group of local community, those can be reserved flexibly with public backyard.

Concerning the horizontal mass, the fundamental intention is to complete existing half block and to follow existing context. So it is important how to respond surrounding context, how to make similarity and difference with surrounding residential buildings as the main public building in Deurne. Especially the main issue is how to make relation with public plaza and how to make continuity with residential alley spaces.

Comparing with existing residential buildings having obvious distinction with public spaces by wall structure, proposed horizontal mass has the column and beam structure and so in the free space, direct continuous relation with exterior public spaces is made in various way. Through exterior corridor I reflected alley space, and through public rooms I intended flexible usages with public plaza. And through exterior terrace above health care center spatial interaction is possible with public plaza. Besides those difference, this mass follows existing context in terms of mass shape (the pitched roof), scale (height, module), material at the same time for the similarity.

2.2.4. façade and material

Regarding material, as I choose traditional brick in surrounding local area, I intended to maximize the design intensity of the buildings in different way of expression (adding plaster layer on the brick to make joint line blurred). Along the composition of two masses reflecting different site conditions in all sides, two masses are molded by micro pixels (brick) and glass curtain wall boxes is attached to the vertical mass for spatial penetration between exterior and interior public spaces. Brick facades in
the vertical mass has two contrast layers, one is very open to the public plaza with regular big openings and the other is almost closed to the apartment side with regular small openings. Especially, the façade facing with apartment is intended to accept the change of season, trees along the time by being read perforated plate as background. And bookshelves integrated with façade facing with the apartment works as the entire background inside the building and the part of those are open to the green. It will give the special background image for this building under keeping the main concept of this building, ‘Urban filter.’ The front façade is designed for being open to the public plaza and at the same time for being shown reflecting surrounding feature from the exterior and so the mass can be recognized to be dematerialized and not to be seen as an object.

2.2.5 conclusion
As concluding remarks on architectural proposal, after analyzing characteristics of existing urban spaces near site, I could conclude that surrounding elements are recognized as urban islands fragmented. It is judged that this is the reason of retired atmosphere for pedestrian and residual exterior spaces are commonly just being used for the movement or parking of cars. Under this condition, as the proposal on urban scale reorganized the urban fabric for providing various levels of public spaces in good quality, in same context I intend new public spaces made for reintegrating surrounding objects. And also on the visual level of pedestrian in the public space, it is examined consistently that the space has appropriate human scale and good quality of space in connection with surrounding context.
Understanding ‘change of urban border’ under urban extension in Antwerp history
Understanding 'change of urban border' under urban extension in Antwerp history

1572-79 (Braun and Hogenberg)
Understanding ‘change of urban border’ under urban extension in Antwerp history
1550 - 1969, Water infrastructure
After collapse of city wall, space of the city wall and the moat became huge empty space. And Suburb started to be developed immediately.
At the Geneva Convention in 1950, a European road network was set up for connecting the industrial, tourist and city centers. The E3 is from Stockholm to Lisbon on a length of about 4000km.
Along huge empty space, groups of high-rise buildings next to highway infrastructure were planned in several projects.
1964, R. Braem drawing 'Deurne in 2000'

Space around Ring was the perfect test area for new building types. People conceived new modern life with high-rise residential towers in Deurne in the future.
In reality, different from previous plans, under capitalism new type of buildings were built focused on economical issues by some developers without consideration of organized urban plan and public spaces. Sporadically those buildings are remained as urban fragments non-contexturally at present. And those kind of private areas have become increased and prevailed.
Against prevailing private areas and car dominant atmosphere, it is needed to secure and revitalize public spaces with recombining isolated urban fragments for local society.
problem statement on urban scale
Problem statement on urban scale
Current public spaces occupied by car and abandoned lands

- a.
- b.
- c.
- d.

Current public space
Abandoned lands
problem statement on urban scale
Lack of
"various level of public space"
"right scale and good quality of public space"
proposal on urban scale
two potential public spaces on different scale
narrow alley as urban livingroom

"worked as a public space for small scale of local community"

"representation of private life"
conditions of spatial quality: human scale

appropriate height and width of surrounding buildings

proper enclosed space
proposal on urban scale
two potential public spaces on different scale - green structure

"importance of accessibility towards landscapes"

green structure as 'Leisure network'
- museum, sports club, cafeteria, park...
proposal on urban scale
proposal on urban scale
reorganizing with various public spaces & connection with green structure

enhancement of accessibility towards landscapes
proposal on urban scale
reorganizing with various public spaces & connection with green structure

rearrangement of ‘public programs’ for reorganization
Recombined urban fabric with various levels of public spaces

Proposal on urban scale

Reorganizing with various public spaces & connection with green structure

On site
- A public plaza for a new center with a community center

Green structure
- A public space on the scale of the whole agglomeration of Deurne

Various size of public pocket spaces

A public space on the scale of representation of a private community
proposal on urban scale
reorganizing with various public spaces & connection with green structure
problem statement on architectural scale
problem statement on architectural scale
urban islands

border of contrasting physical condition in terms of scale

high-rise area

low-rise urban fabric
Residents are questioning the environmental impact of such big ships.

“We can no longer put up with something that affects the health and well-being of the city. We must stop pretending that nothing is going on,” said Saverio Pastor, a local artisan of gondola parts, and a leader in the anti-liner protest movement, which held a news conference here last week...
Modern surrounding buildings are situated in...

standing with overwhelming height and width in a close distance
Modern surrounding buildings are situated in...

facing with the site at the back and with the walls for backside privacy
Historical buildings are being...

only open towards cemetery with fencing in the yard to all sides
Historical buildings are being enclosed and hidden by high walls for requiring privacy.
On site

>>> public street: accessibility towards green structure
>>> public plaza: new center with community center

Proposal on urban scale

Problem statement on architectural scale

>>> isolated urban island
proposal on architectural scale
proposal on architectural scale

project premise - "making site as new center of Deurne in Antwerp"

How activated public spaces can be made with combing surrounding urban fragments?
proposal on architectural scale
program

community center

- multi-purpose spaces
- cafeteria / office
- daycare center
- library
- health care center

renovation of existing priest house

chosen required programs:
- target: all level of people
- character: semi-public, semi-private
- transition space:
  - possible connection with surrounding educational and social institutes
Dominant scale from high-rise

Visual protection for comfortable public space

Proposal on architectural scale

Mass composition

Regenerating public spaces on human scale

Spatial combination on ground level
between public realm and natural elements (stream, green area)
"At a distance of approximately 30 meters, facial features, hairstyle, and age can be seen and people met only infrequently can be recognized. When the distance is reduced to 20 to 25 meters, most people can perceive relatively clearly the feelings and moods of others. At this point, the meeting begins to become truly interesting and relevant in a social context. A related example is the theater..."

- Jan Gehl, Life Between Buildings, regarding distances and communication
Walter Gropius: diagrams showing the development of a rectangular site with parallel rows of apartment blocks of different heights, 1929
proposal on architectural scale

space & program composition

section diagram

mediated surrounding environment by new mass
Public rooms
- Same group of spaces could host several separative workshops, a small play, meetings (supporting the variety of activities needed in small community)
- Sometimes these rooms can be supported for the events on public plaza.

Interaction between sunken public plaza and vertical public space
- Increasing accessibility from public plaza to waterside
- Exterior theater
- Maximizing comfort on public plaza within half-enclosed space
proposal on architectural scale
bird-eye view
proposal on architectural scale
bird-eye view
proposal on architectural scale

public backyard
proposal on architectural scale

portico reference

portico of San Luca, Bologna - leading up to Basilica
Continuous public spaces vertically
- Architectural promenade from the park to city
- Efficient internal connection for library
Combining between inner programs and site condition
proposal on architectural scale
library floor plans
proposal on architectural scale
library floor plans
proposal on architectural scale
sequence
proposal on architectural scale
sequence
proposal on architectural scale sequence
proposal on architectural scale sequence
proposal on architectural scale sequence
proposal on architectural scale

space & program composition

reflection of existing residential buildings with similarity and difference

similarity - shape (the pitched roof), scale (height, module), material

difference - open to the public plaza with exterior corridor, exterior terrace, public rooms
proposal on architectural scale
portico reference
Proposal on architectural scale
space & program composition

Interpretation of two different corners responding site condition

- a. facing with green area & waterside
  b. commencement of block
  c. open to the waterside

vs

- a. on the continuous street
  b. in the middle of continuous block
  c. open to the sky
proposal on architectural scale
space & program composition

Spatial characteristics responding the site condition
proposal on architectural scale
health care center floor plans
proposal on architectural scale
sequence
proposal on architectural scale

sequence
proposal on architectural scale
sequence
proposal on architectural scale
three-dimensional public spaces
proposal on architectural scale
three-dimensional public spaces
proposal on architectural scale
new public street
proposal on architectural scale

program & circulation

Community center
- main hall
- info A/B
- main hall (temporary)
- multi-purpose hall (wedding)
- office (community center)
- cafeteria

Temporary daycare center
- info
- kitchen
- reading room for children
- dining room
- group room (up to 3 years)
- sleeping room (up to 3 years)

public plaza
- multi-purpose space A
- art-class room
- gym (fitness)

multi-purpose spaces
- office
- daycare center
- cafeteria
- public backyard
- parking
- bike parking
proposal on architectural scale

facade

private apartment

brick solid box

brick solid box

glass curtain-wall box

public plaza
proposal on architectural scale

facade

brick with one layer of plaster

double facade - mesh screen + reflecting glass

transparenting glass

brick with one layer of plaster
proposal on architectural scale
renovated from ‘priest house’ to temporary daycare center
proposal on architectural scale
renovated from ‘priest house’ to temporary daycare center
proposal on architectural scale structure
proposal on architectural scale structure
proposal on architectural scale
climate design
proposal on architectural scale
climate design
proposal on architectural scale
detail
Proposal on architectural scale detail

1. Brickwork (230x90x75 bricks)
   - Pointed and surrised with lime mortar
   - Ventilated cavity
   - Vapour barrier
   - 2 pieces of 12mm TEGO plywood
   - STUD (steel channels) = 150x30
   - 150mm glass-fibre thermal insulation

2. Double glazing: 8mm toughened glass +
   16mm cavity + 8mm laminated safety glass (fixed)
   Aluminium frame = 510/50 mm

3. 3mm aluminium sheet

4. 60mm concrete slab at edge of roof
   - 50mm bed of gravel; filter mat
   - Vapour barrier
   - 160mm compression-resistant thermal insulation
   - Sealing layer

5. Double glazing: 8mm toughened glass +
   16mm cavity + 8mm laminated safety glass
   Aluminium frame = 200/50 mm

6. T20 wood siding (W = 100)
   - 50x50STL PIPE 600
   - T100 reinforced concrete

7. t=9.5 2-ply plaster board
   with lightweight steel ceiling frame
   - White paint
proposal on architectural scale
detail
Proposal on architectural scale

detail

**Detail 01**

1. One set of bricks (230x90x75 bricks)
   - Precast concrete (900x1800)
   - Pointed and slurred with lime mortar
   - 50/50 mm steel angles (ventilated cavity)
   - Vapour barrier
   - STUD (steel channels) - 150x50
   - 160 mm compression-resistant thermal insulation
   - 125 mm steel angle

2. Brickwork (230x90x75 bricks)
   - Pointed and slurred with lime mortar
   - Vented cavity
   - Vapour barrier
   - 2 pieces of 12 mm TECO plywood
   - STUD (steel channels) - 150x50
   - 150 mm glass-fibre thermal insulation

**Detail 02**
proposal on architectural scale
detail
1. Mesh screen
   Aluminium frame 150/60 mm

2. Double glazing: 8mm toughened & reflecting glass +
   16mm cavity + 8mm laminated safety glass (fixed)
   Aluminium frame 200/60 mm

3. Mesh screen folding door

4. Double glazing door
   : 8mm toughened & transparent glass +
   16mm cavity + 8mm laminated safety glass

5. Handrail: T12 tempered glass

6. T20 wood siding (W=100)
   .50x50 STL PIPE@500
   .Vapour barrier
   .130mm compression-resistant thermal insulation
     ; sealing layer

7. 60mm concrete slab at edge of roof
   .50mm bed of gravel; filter mat
   .Vapour barrier
   .150mm compression-resistant thermal insulation
     ; sealing layer
proposal on architectural scale

Last impression
proposal on architectural scale model
proposal on architectural scale
proposal on architectural scale model
proposal on architectural scale
model
proposal on architectural scale model
proposal on architectural scale model