Graduation reflection

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Introduction

This reflection paper is about the individual project conducted in the Complex Project studio. The chair of Complex Project (CP) is aimed to investigate all scales of the architectural thinking, details, building, city and region, focusing on dense urban areas development, which also broad the architectural minds and thinking of future architects. ¹

The project performed in the CP gave an opportunity to me to redefine approach to urban and architectural development. It challenges the strict distinction between Architecture, Urbanism, avoiding the linear process of it. To improve and develop any certain targeting sites, it is required to manage diverse relevant factors ranging from social, economic, cultural to political issues. Such factors have to be considered equally with architectural perspective.

In this way, several intensive researches on multiple issues such as social economic, political aspects were conducted in the first session of the studio which is critical steps in advance to build strategy to develop the chosen sites.

Project site and research work

The charging site, the Chicago Lakeside and its neighborhood in the USA have been known as a part of ShouthChicago area. There used to be the Steel Mill factory at the mouth of the Calumet River and Lake Michigan which was a huge economic booster of the site, providing jobs for more than 2,000 of people living in this region.

But now, it is facing the significant downgrading of living quality due to the closing of former still manufacturing factory. Thousands of people who used to work here had to leave to find another opportunity. Thus, all the existing infrastructures like freight railways and bridges as well as neighborhood areas have been abandoned ever after the closing steel industry. Due to this reasons, people in this region are forced to be implicated in illegal industry for living, which is becoming issues in Chicago,

As mentioned above, The research work in the CP is aimed to build general impression of targeting sites and reasoning how the current situation happened and why it is still going on. The work starts

¹ http://www.tudelft-architecture.nl/chairs/complex-projects
from looking at Midwest area, especially focusing on Illinois states where Chicago is included and ends at the SouthChicago area by zooming in to small scale.

Based on this framework, several subdivided topics are categorized covering all the inherited issues ranging from politics, culture, economic as well as existing built environment conditions and assigned to each work groups in charge.

These works help our working groups set up our problem statement that the SouthChicago needs a new power of growth in terms of economic and education for self-sufficient living.

Accompanied with this idea, our group investigated what kind of power the SouthChicago needs and found out the city’s vision that they want to create the most sustainable city in the USA.

- “The Sustainable Chicago action plan offers concrete initiatives, metrics, and strategies aimed at advancing Chicago’s goal of becoming the most sustainable city in the country. From improving citywide energy efficiency and promoting diversified transit options, to launching citywide recycling, the roadmap is robust and comprehensive, touching upon the full spectrum of life for Chicagoans, whether at home, at work, on our streets or in our parks.”

- Rahm Emanuel, Mayor

The city’s ambition is the first step of the answer to our problem statement and we thought combining spatial values to this vision can enhance our strategy. Thus we starts to research the
public demand and several guidelines towards the site and it becomes our base of masterplan. According to the guideline, Chicago set up 5 strategies to strengthen the position of the city as a new anchor in USA.

![Five Strategies Image]

[Source: Chicago Climate Action Plan 2008]

The strategies are aiming the alleviating the unequal balance of energy in Chicago, by introducing citywide recycling industry as well as the improving water quality and water infrastructure so as to make a good connection with the Loop (the center of Chicago) and the others regions.

![Strategy Diagrams]

[figure1. Research book of Chicago, Southworks, Complex project]
Given this, we assume that SouthChicago needs to take advantage of these strategies that recycling industry could provide jobs and it could be a new important initiative of revitalization method. Furthermore, our groups also thought that SouthChicago needs to respond to the growing demands for clean water which is also suggested in the city’s guideline. Accompanied with the need of recycling industry, in the project, we investigated how the SouthChicago could be an model for addressing urban water scarcity and pollution.

**Masterplan strategies**

The next steps to go further, we investigated where would be the most optimistic place to position newly introduced recycling industry. We zoomed into the south part of the site where the rever As a next step to go to plan, our group assumes that these left over industrial heritages such as freight rail way, and Calumnet and Lakeside representing natural resources is the base of our masterplan suggestion. These elements eventually used to be a good tool for delivering raw materials from outwards for previous steel industry thus we made a choice to reuse this site as the first phase of our project.

![Masterplan strategies](figure1. Research book of Chicago, Southworks, Complex project)

As a result, our group made the site transformed to make more convenient freight circulation, considering railways and heavy industrial traffic like trucks. In this regard, we did not only consider the optimistic infrastructural aspect but also look at social aspect. The area is chosen for providing positive influence to the neighborhood which is next to the border of industrial zone. As a transitional threshold between existing neighborhood and the new recycling industry zone, we set
up a position where a new intervention could provide benefit for both neighborhood and industrial area.

We tried to make a transitional change of morphology of buildings for more simultaneous shift so as to avoid conflict between existing and new urban fabric. Following images shows how we set up the new interventions based on our strategies.

In addition to this, we made a special connection between neighborhood and the new industrial fabric which is “green finger”

Our green finger can be regarded as a bridge which is derived from the vision of creating a green connection between the Michigan Lake and the inland area of SouthChicago and provide more clean water to the city. Thus, this horizontally continuous green corridor can also function in different scale, starting from small water treatment basin at street level in neighborhood, ending at the lakeside as a large water filtration park.

In overall, our masterplan strategies can be explained in twofolds; One is to launch new recycling industry as an economic booster of the targeting area, the other is to enhance sustainable image of the city as well as the city’s water treatment system by introducing green infrastructure to the district.
Individual Project

I turned my views to architectural project based on the previous work. Eventually, to realize the vision of launching new recycling industry, the initiative infrastructure system is crucial. However, what I pursued to achieve from the project is not only for building up efficient freight system. It is rather public oriented facilities by combining public function in it. Also by blurring the division between neighborhood and new infrastructures, it is expected to be more intimate towards public and invite more people.
The chosen fragment is the border between the surrounding green finger, neighborhood and industrial area which is to realize such architectural concept.

At first, the main shape is formed reacting on the surrounding conditions. The freight station is leveled down, situating 9m lower than the ground level. The dimension is decided by calculating the required height for passing of two story- intermodal freight train, which is standardly used in USA industry, and the 400m long railway is also decided based on the same principle.

This railway is next to the new industrial area, opened to the air which allows moving crane to touch the freight containers directly and deliver them to another position in recycling industrial district rapidly. This explains why the freight station is situated the backside of the site and by doing this the front side of the site can have more relatively chance to be opened to public and green fabric.

The next step is to add public layers in front of the freight facilities. At this moment a new high speed train station is situated, districked by linear shape of common service facilities for both freight and passenger station. Unlike the freight station, this passenger oriented station is covered by a roof which make a new connection with public activity happened upon the roof. All the station entrance is positioned at this roof level and lit can be through the specially chosen structure system materials of it.
Above the ground level, the overall image of the building is meant to be a new sloped topography of the SouthChicago, where the lake Michigan and new industrial area as well as the new continuous green fabric can be seen like an observatory. This virtual figure has a multiple function from market, parking and hotel. They are blurred behind the sloped surface which is due to the reason that any noticeable distinct between different functions is not visible from outside, but only inside the building, and the level plan is done by considering the accessibility from neighborhood and pubic area.
**Structure system**

Even though the building has a free-free form itself, it has a regular 9 by 18m grid system from the station level to the top and if it is necessary, the distance is changed within this bay. For example, in the station level, for large available space, the bay becomes twice to 18 by 18m and such spans are supported by arch shape of prefabricated concrete component and it allows the two points of forces from the upper part to flow through the shape, concentrated to one point.

This arch-shape of roof could be produced in a same module so as to be assembled and repeatedly arrayed in the site also provide artistic impression of station area. Following the forces, each component can be transformed, having a void gap, which makes also another artificial topology on the ground.

The above part of the building is made out of two way of composite steel frame system to protect steel materials from moisture and fire and make consistency between the concrete structural component of station.
Façade system and climate concept

As the building represents the new recycling vision of SouthChicago, the building should express such concept to public so that people can remind of the vision. Thus the roof is covered by ecological materials like grass, wood for some part, which provides consistent images with the green finger in front of the building and prevents the building to be overheated as well as heat island effects of whole site.

Since the building is situated in a linear way along the Calumnet river and green finger, facing mainly north and south, thus the façade reacts depending the sun orientation, resulting horizontal photovoltaic panels on the South side, vertical louver for North, vertical and partially horizontal louver in West side.

The building’s ventilation system is mechanical operated for market and station area and also partially aided by human-operated operable façade for hotel.

For the material choice of station roof system additionally, I searched specific products which is called “Hole deck” slab which is combined with the roof system. It is specially designed to reduce the weight of materials and air ventilation duct to be installed inside the hole of it as well as to make lit go through. By applying these materials, the underneath station can have daylight with minimum weight of roof which is possible to pass through on the top of the roof and the concrete material is functioning as high thermal mass.
The building have four different functions and the different time spectrum when each space are used. Due to this reason, I need to differentiate the each zone and decide either it is for individual users in hotel rooms or for the large room such as market and lobby. Basically convective HVAC(heating, ventilation and air conditioning) system is chosen, and each systems are installed in the hole of main steel structural cellular beams. In the hotel, specifically floor radiant heating system is installed and additional fan coil unit system is also planned for individual control of each hotel rooms.

For saving energy to heat or cooling air, the water collected from sloped roof can be reused as a energy resources. The water is heated by thermal photovoltaic panels installed in the glass roof and the heat is accumulated into thermal thank in the top of parking area.