Complex Projects  graduation studio Msc4 | Chicago Lakeside
Southworks | Technology Center
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2014 | December
Complex Projects graduation studio Msc4
“Chicago Lakeside”

Design Booklet

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2014, December
Urban
1. City profile
2. The Site
3. Urban Plan

Architecture
4. Design Concept
5. Spatial Program
6. Interior

Building Technology
7. Structure
8. Materialisation
9. Climate design
10. Reflection
MIDWEST
area: 1.990.185 km²
population: 65,4 million

UNITED STATES
area: 9.629.091 km²
population: 318,5 million
CHICAGO
area: 606 km²
population: 2.7 million

ILLINOIS
area: 149,998 km²
population: 12.9 million

SOUTH CHICAGO
area: 8.65 km²
population: 31 thousand
City Ranking
Chicago is the third highest GDP in USA

Nicknames
The Windy City, the City of Big Shoulders, the Second City, and The City That Works.

Landscape
26 miles of lakefront, 552 parks
Demographic
77 community areas containin
more than 100 neighborhoods

Population
The third largest city in the United
States, with a population of nearly
three million people

Culture
More than 200 theaters, Nearly
200 art galleries, 36 annual pa-
rades, More than 7,300 restaurants

Architecture
The world's first skyscraper, and famous architects
like Mies van der Rohe, Frank Lyd Wright, Louis Sul-
vian, Daniel burnham.
CITY PROFILE OF CHICAGO  RESEARCH SMLXL

FIGURE 1
- 5.5% Asian
- 13.3% Other
- 31.7% White (non Hispanic)
- 28.9% Hispanic
- 32.9% Black or Afro American

FIGURE 2
- 0-10%
- 10-20%
- 20-35%
- >35%

FIGURE 3
- 0-10%
- 10-20%
- 20-35%
- >35%

FIGURE 4
- 0-10%
- 10-20%
- 20-35%
- >35%

FIGURE 5
- 0-10%
- 10-20%
- 20-35%
- >35%

FIGURE 6
- 0-10%
- 10-20%
- 20-35%
- >35%

FIGURE 7
- 0-10%
- 10-20%
- 20-35%
- >35%

The indicated city zones of each community area.
2_THE SITE
History of the site

This site was home to a giant steel mill “U.S. Steel”. Built in 1880 and strategically located at the mouth of the Calumet River. South works would become the third biggest steel mill in the world by the time it turned 1975. During its roughly hundred-year lifespan South Works made I-beams and angle bars for building and bridge construction. They made the kind of large steel girders used in skyscrapers, including 42,000 tons of steel used to erect the Hancock building. At its peak South Works employed nearly 20,000 workers, most lived in surrounding of South Side neighborhoods.

The one industry that made South Chicago was Steel. South works was the big daddy of all steel plants in the Midwest. By 1901 the facility stretched all the way north to 79th Street. That was the year it became part of the new U.S. Steel Corporation. South Chicago was annexed by Chicago in 1889. The community then had about 24,000 people, and more were on the way. Many of these settlers were Poles and other Eastern Europeans. Housing was built quickly and cheaply. The blocks near South Works were divided into “shoe-string lots”—140 feet long but only 25 feet wide, and crammed with frame cottages and two-flats. The result was the worst living conditions in Chicago. The steel mill that gave jobs also fouled the air and deafened the ears. The land itself was low and swampy. One writer described the area as having “pools of water, ditches clogged with soot, garbage, and industrial debris, [as well as] decomposed animals.” (Amer,2011) Things were better away from the mill. The northern sections of South Chicago remained vacant until the 1920s. Then brick bungalows began going up. Population growth continued, peaking at 56,000 in 1930. Now the residents included many Mexicans, with a sprinkling of African-Americans. The blocks around 92nd and Commercial became a major commercial district—locals referred to it as “Down-town.” South Chicago was made by Steel. At one time, about 70% of the adult men were employed in the steel industry, at South Works or at other plants in nearby communities. The Chicago-Gary corridor was the steel-producing center of the world.

The American steel industry declined after World War II. South Chicago suffered through the decline. The final blow came in 1992, when South Works closed for good. Most of the signs of its industrial history are gone, when the plant was closed in 1992. The only remains of the steel plant are the ore walls. The ore walls run parallel to what would have been the docks right on the water. Now, they look like strange monoliths or ruins from some ancient civilization. They are all that’s left of the facilities used to store the raw iron ore shipped into the steel plant. The reason why they are still there is because it is very tough to demolish. Today the community is trying to rebound. The 2010 Census counted about 32,000 residents. The population is 75% African-American, the rest mostly Hispanic. Ambitious plans have been advanced for developing the vacant South Works land. And once again, this site may become the key to the survival of South Chicago.
Figure 18. South Chicago’s location at the intersection of river and railroad transportation routes fostered early growth.

Figure 19. South Chicago was annexed by Chicago in 1889. The community then had about 24,000 people, and more were on the way. The steel mill created a whole new community.

Figure 20. In 1901, the steel mill became U.S. Steel South Works. It was the largest mill in the area and employed as many as 20,000 workers at its peak. Population growth continued for South Chicago peaking at 56,000 in 1930.

Figure 21. On Thursday Jan. 9, 1992, the announcement of the shut down was official. In April of the same year the mill closed with less than 700 workers. South Works need a new plan!
This is lakefront property. It’s huge, bigger than the Loop. No surprise then that developer Dan McCaffery plans to create practically a new city here: more than 13,000 homes, upscale shopping, a marina, a scientific research park, wind turbines, a charter school.

“When you think about the scale, and the fact that it’s been 25 years since that community was basically abandoned, with respect to a job-maker this thing has got enormous potential consequences,” McCaffery said (developer).
Fig 25. Existing Program

Legend:
- Healthcare
- Sports Facilities
- Religion
- Community Government
- Culture
- Retail
- Commercial/Logistics/Storage
- Transport
- Education
- Industry
- Offices
- Housing
- Parks and Open Space
the neighborhood, every corridor has a main system. The corridors act as different organs in anchors at macro scale, intensified by local interventions. This will introduce new people to the site. The interventions will have an regeneration effect on the local environment and attract further development on the site.

FIG 30. The aim is to create a network of anchors at macro scale, intensified by local micro interventions. The structure is based on several important corridors on the site. These corridors are the strong (linear) lines that play an important role in the urban grid system. The corridors act as different organs in the neighborhood, every corridor has a main dominant function. The corridors intersect and create strategic points, where to insert strong anchors on the site. The different developments in the corridors meet and connect in these intersections.
**ATTRACT**
The green corridor will act as a public space for social connections. It will promote pedestrian mobility. Walking will allow the inhabitants to discover the site and enjoy the landscape.

**CONNECT**
The second stage is to expand the green towards the waterfront and connect the neighborhood with the waterfront. Along the corridor site will provide a route towards the waterfront that will enhance walking and linking in most functional movement.

**MERGE**
Different cultural and leisure programs as the beach or marina will also part of the green corridor. There will be space for artistic activities. The corridor will transform to an hybrid landscape with mixed programs.

<table>
<thead>
<tr>
<th>Establish</th>
<th>LINK</th>
<th>Enhance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create new social connections with public programs like a library or an community center.</td>
<td>Mining generations and create social relationships. Introduce cultural and artistic programs. Link programs together.</td>
<td>Enhance the community.</td>
</tr>
</tbody>
</table>

**Fig 31. Development Civic Corridor**
LAKEFRONT
There are 26 miles of lakefront, all of which is public property. The Chicago Parks District is responsible for construction and management of the waterfront. A pedestrian and bike trail extends 18 miles along the water. In Burnham’s urban planning for Chicago in 1909, one of his aspirations is to preserve all the lakefront area as open public space. After 100 years of development, his planning is still working. But in the south work area, the continuous landscape along the waterfront is disrupted by an originally steel factory. After the Chicagoan industry shrunk, the south works remain desolate, while the continuity of landscape remains intermittent.
3_URBAN PLAN
The chosen fragment to develop includes the harbor, the Ore walls, park, and the Lake Shore Drive. The linear fragment connects the neighborhood with the waterfront. This is done thru a linear landscape that runs parallel with the Ore Walls on the site. The fragment is divided in several strips:

**Commercial strip** : This is for business and enterprises. Startup companies will be able to use the harbor as a start location for new developments.

**Cultural strip** : This strip includes cultural activities. These buildings are set on top of the Ore walls. With interruptions of green courtyards the strip acts as a street between the walls. The circulation goes thru the walls and the building itself. These cross connections goes from north to south and reverse, to connect the harbor with the landscape. The program consists of a Technology center, library, conference center, theater, community center and an art museum.

**Landscape** : The landscape in a linear park parallel to the Ore walls and a thematic park between the Ore walls. The total length of the landscape strip is 1.8 km. It starts in the center of the neighborhood and goes towards the Michigan Lake.

**Educational Strip** : This strip contains the future faculty buildings of the HIGH Tech campus. This building strip is located between 87 streets and the Park. The building has got an orientation to the street from the South side and an orientation towards the park on the North side. There are cross connections from the harbor towards the campus.
4_SPATIAL PROGRAM
DESIGN | CONCEPT
5_DESIGN PRODUCT
DESIGN | PLANS HIGH RISE
Overall design

The South Works Technology center is a new institution for communication, research and education. The project is situated on the former site of "The United States Steel South Works". The project involves several programs as; laboratories, work studios, auditorium, indoor garden, exhibition halls, library and the planetarium. The rehabilitation of the existing Ore Walls was done with the intention to use the spatial properties as possible and provide them more accessibility. The Roofing of the walls is light I structure in the design that can be repeated on the total length of the walls. Opposite to the long Ore wall structures, rises the vertical element of the design. This tower is located on the lakeshore drive and is a landmark and an urban icon that will be visible from other parts of the city.

Program articulation

The program is divided in a public and a private part. The high rise is enveloping the specific program as the laboratories and the studios for the students. These stacked program results in a tower of 84m high. Vertical transportation is made possible by two cores with stairs and elevators. There are also some podiums stairs that connect two levels, which it generate an interaction between the levels and create a higher open space. The large stairs operate as podiums that can be used as lecturing en meeting areas.

The low rise contains the generic part as the exhibition areas, the indoor gardens and the planetarium for the visitors. The horizontal program is divided by transparent curtain walls. There are two levels, the ground floor and a work platform at the second level. In the work platform contains computer work areas, meeting rooms and large balconies. These balconies have a visual connection with the program on ground floor. The second level is a more intimate space because of the smaller distance between people, a place for work discussion and interaction. The ground floor is a more open large space, where the activity that is going on the central attention receives. The successive programs are organized in a linear way between the Ore walls. It is a public indoor street that is interrupted with curtain walls. This street is connecting the different functions and it also reflects the changing experience of light and space through the building.
6_ INTERIOR
Indoor garden

GALLERY
Indoor garden

Entrance auditorium
7_STRUCTURE
STRUCTURE | GRID
DESIGN

51 m
8_MATERIALISATION
DESIGN | ELEVATION NORTH
Inlet Fresh Air

Inlet fresh air by wind direction in the night

Air Extraction through cavity

Air Extraction through cross ventilation

Air keep inside the Cavity as insulation

Mechanical Air Extraction

Air keep inside the Cavity as insulation

Natural ventilation
Climate scheme - Summer

- Inlet Fresh Air: 28°C
- Mechanical Air Extraction: 24°C
- Floor Cooling: 24°C

Climate scheme - Winter

- Inlet Fresh Air: 26°C
- Mechanical Air Extraction: 24°C
- Floor Heating: 24°C
MATERIALISATION | ROOFPANELS

Roof surface             Climate

ETFE pillows             Climate

ROOFPANELS

MATERIALISATION
10_reflection
Reflection

Student: Mahedy Al Sraiffe
Student number: 4076478
Studio: Complex Project
Project title: South Chicago High-Tech Hub
Teachers: Henri van Bennekom
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Introduction

My graduation project is about the lakeside development in South Chicago. Chicago South-works was home to the previous US steel manufacturing plant. About 20,000 thousand people worked and lived at south side. The mill started to decline in the 70 ties because of the shifting market for steel. US steel closed his doors in 1992. The site has lost about 20,000 people, 40 percent of its population. The 20000 people are gone. The impact of the shutdown of the steel industry is still visible in the South side neighborhood, but spirit of the manufacturing still runs through the neighborhood of south Chicago.

The long abandoned site contains of 227 ha empty land is a potential area for new development. The Goal of the studio is to create a strategy for the site. It includes a long term vision and a proposal for the first program. The strategy is based on urban analysis of the neighborhood and the city of Chicago. The assignment is to determine a new program and design the first intervention on the site.

Research Objectives

My strategy was to start a new development that will help the revitalization of the neighborhood and attract new people to the site. I will try to bring people back to the site with a new industry. This industry will focus on the growing number of creative's, students and entrepreneurial engineers. South works will transform to a ‘Start-up Hub’ for small technology firms.

Research Method

1. SMLXL: The first step was the research of different scales of the country, state, city and neighborhood. The research focuses on different themes: culture, infrastructure, history, economy, politics and urban analysis.

2. Field research site and city: In October 2014 we went with the whole group to Chicago for a study trip. The trip includes a tour through the city and the site, lectures from the developer and lectures with the Architect (SOM), lectures on the De Paul University about the economical and political system in Chicago and lectures on the Illinois University of Technology and students work.

3. Literature study: We start with a specific research using the SMLXL research books to create an urban strategy and finally a proposal for the program.

4. Urban plan: After the literature research analyzing the master plan of SOM I focused to choose an urban fragment to develop. The development is about to choose and create new program, massing and infrastructure.

5. Architectural intervention: In this stage I started with the design of the first building on the site. The design is based on an urban concept that relates to the long vision strategy and the neighborhood, and an architectural concept that relates to the program and future users.
Urban strategy

1 insertion: Establish new program that will have a regeneration effect on the local environment and attract and promote further developments to the site.

2- Expansion: The area will become a destination for outsiders. The university will expand and new companies will start to settle. New program will be ad like sport, commercial and cultural facilities.

3- Colonization: By this stage a new community is established that consist of a variety of groups.

Architecture design

My chosen program is a Technology center. The technology center is an academic and public building that is part of the University of Chicago and the government of Chicago.

The building offers the following main activities:

1- Produce : laboratories where professionals can work and do research on electronic, mechanical and digital products.

2- Present : a public showroom for visitors and tourists where people will be introduced to technological and digital products.

3- Learn : college rooms and auditoriums for teaching and for large conferences.

4- Work : flexible office space

5- Relax : a nice café and lounge

6- Store : large storage spaces

My ambition was to introduce a new kind of an industry to the site. I would like to transform Southworks to a High-Tech hub by establishing a technical university and High-Tech enterprises.

This program will be the first anchor that will act as a catalyst in the site. It will attract people from whole Chicago to visit, work and learn.

This program will attract new population to south Chicago. The actual communities consist of about 80 percent of low educated Afro-Americans and Hispanics. People like students and professionals will generate a positive energy in the site and the local neighborhood.

The building will be the first project in the site. This building will have a relation with wide social context. The building will be a place of adventure and discovery. People will be introduced to the digital world and understand the technology that is surrounding them. The technology center will have a public and a private program. The building will help to create an interaction between the public visitors and the professional users (the geeks) who work in the building. It is important to use all the good qualities of the site: the water, the ORE walls, landscape and the existing infrastructure. The building will have a fluent relationship with this context. Visibility is a very important key to represent the program of the building.

Relationship between Research and design

The research is quite important to create a design question and narrative that is based on facts and objectives that are done though different analysis on different scales and themes. The design will try to integrate the whole range of requirements that relate to the program and the users. The product will try to give an answer in the form of a volumetric solution that is translated in space.

Project and the wider social context

The project is part of the long vision master plan that will help to bring back a new kind of industry to the site. Because it is the first project on the site it will act as a catalyst to generate new activities that will help to improve the image of the site and neighborhood. The chosen program: Technology center will be a pilot project in South Chicago to create a space for that makes education and science in particular, personal, fun, participatory and relevant for the community, state and region.