CHICAGO LAKESIDE PUBLIC HEALTH EDUCATION CENTRE

INTERACTION

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COMPLEX GRADUATION PROJECT - CHICAGO SOUTH WORKS
part 1 general analysis
part 2 group strategy
part 3 individual design
  3.1 mission & program definition
  3.2 site choice
  3.3 concept evolution
  3.4 form generation
  3.5 route organization
  3.6 structure proposal
  3.7 climate proposal
  3.8 material proposal
  3.9 conclusion
part 4 reflection for p4
part 5 drawings
part 6 renderings & model photos
The theme of the studio is to explore the lakeside field as the site with an ambition to help Chicago achieve its global ambitions. The chosen site is nearly 2.8 sq. kilometres and is surrounded by 79th Street on the north and the Calumet River on the south. It extends to Burley Street and Green Bay Avenue on the west and Lake Michigan on the east. It is located 15 miles south of the Loop and 10 from west from the Midway International Airport. It used to be the south works site of US Steel which was symbolized as the anchor and heart of the district.
PROBLEMS

The South Chicago neighbourhood declined from the end of the last century with the close of US Steel. The district lost its economic anchor and a series of social problems appeared such as unemployment, street violence, shortage of qualified education and public health crisis. No investor is willing to cultivate this field because of its bad conditions, and the residents live in a worse and worse environment. So the most urgent thing they need now is a new anchor as a strong identity which could help them to reach a new golden age.

SITE CONDITIONS

- existing metra line
- existing lakeshore drive
- existing bus stop
- existing road
- existing ore walls
- existing velodrome
- existing lakeside park
- harbour and Michigan Lake
- existing lakeside park
Healthy Chicago identifies 16 health outcome targets, 12 priority areas, and 193 supporting strategies. It is a continuous project with stable investment, and the government’s support makes the healthcare development available. A part of the agenda has been put into practice in small scale projects, and in the following years, it needs a place to establish a strong and centralized public health base.
ASPECTS OF HEALTH CITY

* Respond to the development of the Chicago public health agenda, we propose a health city in the South Works site. We summarized 10 aspects for the definition of our health city. There are 10 aspects in our definition of health city. We divide them to two main categories: health science related and health lifestyle related.

ORGANIZATION OF HEALTH CITY

* Respond to the two main categories, the site of our health city consists of two interconnected parts: Health science campus and healthy lifestyle communities. They support for each other to create investment attraction, job opportunities, qualified health care service and education. It will finally become the new strong anchor for the South Chicago and totally improve the life quality of the neighborhood. South Chicago will finally reach its new flourish time with the new identity of Health City.
There is a vacant space connecting the west neighbourhood and the centre part of our site. To respond this kind of connection, the health city is centralized with a health science campus. And several healthy lifestyle communities located on each side of it.

“A CAMPUS IS ALMOST A GUARANTEE TO HAVE A MIXED RACE WITHOUT ANY SIGNIFICANT SOCIAL PROBLEMS SINCE IT ATTRACTS MULTIPLE PEOPLE. THE NEIGHBOURHOOD WHERE DE-PAUL UNIVERSITY IS WAS 30 YEARS AGO A POOR, GANG-INVESTED, HIGH CRIME GHETTO AREA AND NOW IT IS ONE OF THE BEST NEIGHBOURHOODS IN CHICAGO.”

From the political science lecture in De-Paul University on 08. Oct. 2013

The ore walls are important symbols of the past industrial atmosphere in the site. However, they lost their values with the decline of the US Steel, and now they need new identities to prevent themselves from being demolished. So we design different space qualities along the walls to create different identities for the heritages.
The ore walls divide the campus centre into 3 strips. We endow them with different space qualities to create different experience.
STEP 1: Compare to the west neighbourhood threatened by crime and unemployment, the east scenery of beautiful landscape is more attractive for people. So we make a FROM EAST TO WEST development strategy for our campus. Firstly we propose some shared public buildings along the ore walls and an education zone at the east end of the central axis.

STEP 2: Union research zone and patient care zone begin to be constructed.

STEP 3: Mixed development of business & research zone

STEP 4: Expansion of education zone mixed with health related business And continue to grow into new communities along the N-S axis.
MASTER PLAN

◆ Core of Health City: The health science campus cluster.
◆ The design of residential clusters is focused on the creation of healthy living environment. It encourages healthy lifestyle and reduce use of cars. There are sub-cores in each cluster which providing health related facilities.
◆ The vast green space and beautiful natural environment.

PART3 INDIVIDUAL DESIGN
The building responds to the definition of health city with the following three aspects:

- Enhance the awareness of public health.
- Provide with healthy food related information.
- Example of sustainable building.

The mission of the building is to integrate the health city’s resource and introduce it to more people. It provides a place to show the concept of health city, and the other parts of the health city support the daily operation of the building. The success of the building will exert a positive influence on the following development of Health City. An increasing number of people and investors will be attracted to this place. And finally, South Chicago will reach its new golden age with the new brand of Health City.
PROGRAM DEFINITION

◆ PUBLIC HEALTH EDUCATION CENTRE
An interactive platform introducing people with some basic information about the Health City project and enhancing the awareness of public health.

TARGET GROUP

◆ INTERACTION BETWEEN TARGET GROUPS

PUBLIC VISITOR

- VISITORS FROM OTHER AREAS
- RESIDENTS IN ADJACENT COMMUNITIES
- PATIENTS

PUBLIC HEALTH EDUCATION CENTRE

- HEALTH-RELATED BUSINESSMEN
- RESEARCHERS
- LOCAL PROFESSIONAL
- STUDENTS
- DOCTORS
- PROFESSORS
- RESIDENTS IN ADJACENT COMMUNITIES
- PATIENTS

LEARNING SPACE

- Seminars

EXHIBITION SPACE

- Exhibits

FOOD SERVICE SPACE

- Restaurant
- Cooking Studio
- Others
At the beginning, there is already a lakeside park attracting people to the east end of the campus. And in our group strategy, we propose a linear park to conduct people to there. In other words, the east end of the campus centre is the most attractive place so I choose here as the start point of my building.

The existence of the ore walls and the lakeside park is the essence of the south works site which makes it unique and different to any other areas in Chicago. And the ore walls are abandoned now, they need some new identities to prevent themselves to be demolished. The intersection between historical atmosphere and natural environment endows my building with much more attractive characteristics. And at the same time, my building provides the historical heritages with a reason to be explored again.
The public health education centre is firstly an interactive platform between public visitors and professors & students in the education zone. And the interaction activities will be expanded into more fields on the following stages. Researchers, doctors, patients and businessmen will join in the interaction with public when the related zones are constructed in the following steps.
The valuable ore walls constrain people's view inside the narrow and long space in the site. In other words, it's difficult for people to perceive the beautiful natural environment even when they are close to it. So a design which could bridge the space inside & outside the ore walls is necessary here.
The ore stone storing inside the walls looks like a series of hills with the effect of the gravity.

At the industrial time, a volume was surrounded by the solid ore walls and the sliding crane.

The volume was divided into two separated parts: the lower introverted space and the upper extroverted space. The former one was a symbol of the historical atmosphere, and the latter one provided the opportunity to overlook surrounding natural environment. It looks like two parallel lines without intersection forever.

The original scenery inside the volume consists of a series of ore stacks which makes the relationship between the two types of space more sensitive.

The original space prototype of the ore stacks could be abstracted as a landscape form. The oscillating surface of the landscape creates interaction between the extroverted space and introverted space.

Interactive activities inside the oscillating landscape volume bring additional value to the both kind of space.
ARCHITECTURAL FORM GENERATION

- Create a landscape volume to integrate historical atmosphere & natural environment.
- Because of the limitation of the ore walls, there is a shortage of natural light and view.
- The volume is divided into three parallel parts which are staggered with each other. Better views and more sunlight are allowed inside the building.
- Volume adjustment according to the existing north-south routes in the master plan.
- Make the central volume more approachable to respond to the west-east route in the master plan.
- Consideration for the different roof space qualities and program demands.

INTERACTIVE ROUTE ORGANIZATION BETWEEN DIFFERENT CIRCULATION

- Connection A: Vertical circulation: elevator & stairs
- Connection B: Gentle pitched green roofs & outdoor cafe Interaction between exterior & interior routes
- Connection C: Outdoor grandstand & stage Interaction between exterior & interior routes
- Connection D: Steep pitched green roofs & landscape pool Sight connection between top and bottom

INTERACTION BETWEEN N-S PUBLIC ROUTE & W-E SEMI-PUBLIC ROUTE

There is a north to south pedestrian route passing through my individual site. It is a district level diagonal route connecting the north communities, the campus and the south communities. My building is along with west to east campus route and finally guide people to the lakeside park. So there is an unavoidable intersection with the diagonal district route. Here I show my consideration about the intersection part between the district level route and the campus level route.
DIFFERENT ARCHITECTURAL ATMOSPHERE ALONG THE ROUTE

INTERACTION WITH NATURAL ENVIRONMENT

INTERACTION WITH HISTORICAL ATMOSPHERE

INTERACTIVE ROUTE ORGANIZATION BETWEEN DIFFERENT PROGRAMS

◆ The five volumes of different architectural program are connected by an interactive main outdoor route. And people also could go through the main volumes along the interior route.
FUNCTIONAL DIVISION

VOLUME OF LEARNING SPACE
It integrate the academic resource of the campus and the public demands for health knowledge.

SPACE REQUIREMENT:
Close to the education zone of the campus
FUNCTIONAL DIVISION

- SPACE REQUIREMENT:
  - different size
  - different privacy

LECTURE ROOM

WORKSHOP ROOM

SEMINAR ROOM-A

SEMINAR ROOM-B

TALKING GROUP

Roof plan 1:200

Ground floor plan - Lakefront part 1:200

Public Health Education Centre

Mingjie Ning #4228499
According to the collaboration with schools and companies in Chicago, an increasing number of people will be organized to visit our exhibition of health city.
PROGRAM 2: EXHIBITION SPACE:
PERMANENT EXHIBITION: History, achievement and vision of public health agenda of Chicago (the transformation of the South works site)
TEMPORARY EXHIBITION: Cutting-edge products and knowledge

Medium installation experience space & traditional exhibition space
VOLUME OF HEALTHY FOOD SERVICE:
Provide a healthy dining place for people attracted by the existing lakeside park and new healthful plant garden. Floating gesture provides people with more attracting experience with the beautiful natural scenery.

SPACE REQUIREMENT:
Good view
Close to the natural environment

FUNCTIONAL DIVISION

PROGRAM 3: FOOD SERVICE SPACE
HEALTHY FOOD COOKING STUDIO
HEALTHY FOOD RESTAURANT
Along the special designed routes, when people walking between the ore walls, they could experience the historical atmosphere. When they walking inside the buildings, they could join the activities with different groups of people. And when they walking into higher space, they could break the limitation of the ore walls to enjoy the beautiful natural environment surrounding them. Along the interactive routes, they could easily switch between upstairs and downstairs, inside and outside, history and reality.
INTERACTIVE ROUTE ORGANIZATION BETWEEN DIFFERENT ROOF QUALITIES

◆ VARIOUS SPACE QUALITY ON TOP OF THE BUILDING

- Public green roof with walkable route
- Walkable grandstand
- Semi-public green roof
- Unapproachable green roof
- Wood paved central route

MASTER PLAN

- Healthful plants garden
- Linear park
- Michigan lake
- Harbour
- Learning volume
- Bicycle station
- Exhibition volume
- Food service volume
INTERACTION BETWEEN ARCHITECTURE CONCEPT & STRUCTURE PROPOSAL

According to the 3 parallel strip architectural appearance, I adopt some parallel rows of columns with different heights to support the pitched roofs. So the roofs could have their different pitch in a flexible way.

Two way flat plate system:
- Thickness of the floor: 260mm
- Size of the steel column: 350*350mm
- It is an effective way to adopt two way plate system in the triangular section design, because it could reduce the height of the structure to make more corner space available.
- It is also a kind of consideration about the continuous strip space quality without any obstruct on top of the space.

INTERACTION BETWEEN ARCHITECTURE CONCEPT & CLIMATE PROPOSAL

- The green roof responds to the oscillating landscape shape of the architecture design which could integrate the historical atmosphere and natural environment.
- The double glass curtain wall allow people inside the building have close contact with the exterior healthy environment.
- The surface water energy exchanger system is a strategy based on the site where close to the Michigan Lake.
- DIAGRAM IN SUMMER

DIAGRAM IN SUMMER

- Evaporative cooling
- Water runoff
- Accelerate surface air ventilation
- Floor cooling system
- Surface water heat exchanger system
- Heat insulation of wall
- Mitigate overheating
INTERACTION BETWEEN ARCHITECTURE FORM & CLIMATE PROPOSAL

◆ DIAGRAM IN WINTER

- **heat buffer**
- **heat collector**
- **floor heating system**
- **heat insulation on wall**
- **surface water heat exchanger system**

CLIMATE DESIGN: GREEN ROOF

◆ Green roof is a typical sustainable way of helping architects to adjust indoor climate. It could prevent overheating in summer and keep temperature in winter. It is an important connection between my building and the health theme.
**CLIMATE DESIGN: DOUBLE FACADE**

◆ **IN SUMMER:**
Open the electric rotating windows on the outer layer. The stack effect accelerating the air ventilation inside the cavity reduce the surface temperature.

◆ **IN WINTER:**
The closed double facade acts as a heating buffer. Sunlight heats the air cavity and most of the heating energy will be gathered on top of the triangular facade. We could consider to install a heat collector there to use the energy to help improving the efficiency of surface water heat exchanger system.

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**CLIMATE DESIGN: SURFACE WATER HEAT EXCHANGER SYSTEM**

◆ **SURFACE WATER HEAT EXCHANGER SYSTEM:**
It is reasonable to propose the surface water heat exchanger system because my building is close to the Michigan lake and the harbour. And it could be considered to be combined with the floor heating & cooling system and ventilation pre heating & cooling system inside the building.
The design responds to the challenge of the orewalls. Inspired by the original scenery inside the orewalls, I design an interactive route to bridge the historic atmosphere inside the orewalls and the natural environment surrounding it. So people could experience both of these two space qualities conveniently.

The structure, climate and material proposals all dedicate to improve the architecture concept of interaction which stands for less obstruction and more extension.

The design principle of interaction coincides with the group spatial strategy of the master plan. For one thing, the interactive route system in my building is an important part of the west to east routing of the public building strip between the ore walls. For another, I establish connections between the public building route and the diagonal downtown-view route in the design of my building.

MATERIAL PROPOSAL

◆ GRASS ON TOP OF THE ROOF: Continue the lakeside landscape.
◆ TRIPLE GLAZING BANISTER ON EDGE OF THE ROOF: Allow people on the roof to have a close contact with the surrounding healthy environment.
◆ WOOD CEILING AND FLOOR: Create a kind of nature related atmosphere inside the building.
◆ GLASS CURTAIN WALL: Expand the interior view to the beautiful landscape.

CONCLUSION

◆ The design of the building follows the frame of Health City, and shares the same mission with the Health City. My building achieve the mission of attracting people through the interactive design with the attractive assets in the site.

◆ The design principle of interaction coincides with the group spatial strategy of the master plan. For one thing, the interactive route system in my building is an important part of the west to east routing of the public building strip between the ore walls. For another, I establish connections between the public building route and the diagonal downtown-view route in the design of my building.
The theme of the studio is to explore the lakeside field as the site with an ambition to help Chicago achieve its global ambitions. The chosen site is nearly 2.8 sq. kilometres and is surrounded by 79th Street on the north and the Calumet River of the south (Fig. 1). It extends to Burley Street and Green Bay Avenue on the west and Lake Michigan on the east. It is located 15 miles south of the Loop and 10 from west from the Midway International Airport. It used to be the south works site of US Steel which was symbolized as the anchor and heart of the district (Fig. 2). However, the South Chicago neighbourhood declined from the end of the last century with the close of US Steel. The district lost its economic anchor and a series of social problems appeared such as unemployment, street violence, shortage of qualified education and public health crisis. No investor is willing to cultivate this field because of its bad conditions, so the residents live in a worse and worse environment.

Under such a circumstance, our group propose a health city as the new anchor for the South Chicago. In the research process, we found there is a public health agenda in Chicago unveiled in 2011 (Fig. 3). There are 16 health outcome targets, 12 priority areas and 193 supporting strategies in the agenda. It is a continuous project with stable investment, and the government’s support make the healthcare development available. As I mentioned above, South Chicago neighbourhood is a district threatened by the public health crisis, and especially bad in HIV and obesity prevention. Fortunately, these problems will be overcome by the 12 priority areas of the public health agenda which dedicates to improve the public health in policies, services, education and public awareness. And when the health city project is constructed, visitors and investors in other areas of Chicago will be attracted and a huge number of job opportunities could be generated to the adjacent residents which could help them to improve their neighbourhood. Finally it will replace the US Steel to be the new strong identity and anchor for South Chicago.

There are 10 aspects in our definition of health city (Fig. 4). We divide them to two main categories: health science related and health lifestyle related. In our phasing planning, a health science campus will be proposed at the centre of the site along the west to east axis firstly (Fig. 5). The campus will develop in a mixed use principle. The education zone, research zone, patient care zone and business zone are interconnected to create a integrated health science campus. Then several healthy lifestyle communities will be constructed in each side of the core campus along the north to south axis. Different groups of health related people, such as health related professors, students, researchers, businessmen and residents, will be gathered in the interactive platform. The interaction between the professional will help to generate new and better ideas of health science, and the interaction between the professional and public will make the education resource more flexible and effective to enhance the awareness of the public health.

In my individual design, I choose the public health education centre to make further development. The theme of my individual design is interaction. This interactive platform which accommodates learning space, exhibition space and food service space will be shared by all the health related people. Different groups of people could organize their own workshop and exhibition here according to different demands. For example, people in research zone could held a lecture here to show their latest research findings to other professional or public visitors according to certain subjects. On the other hand, the health related businessmen could organise a exhibition to the public to improve the market potential of their products. And for patients, they could find better place to talk with their counterparts than in hospitals. Students also could obtain valuable experience during the different workshop, seminars and exhibitions.
◆ Relationship between methodical line of approach of the studio and the method chosen by me:

With public facilities are good examples for my public health education centre. Rooms as well as space for consultations between patients, doctors, therapists and technicians. The interaction modes and cooperation of the presentations and simulations of the technically most advanced orthopaedic products. The other floors provide seminar and conference design depend on our strategies. We analyzed several medical colleges in US and Europe and tried to find some useful reference. Finally, we search lots of information from literature and on the internet. The main work done by me is on the M research booklet. Secondly, I followed the studio structure illustrated above. Firstly, I went to Chicago with the studio and make a solid research and analysis on different site & neighborhood. Fourthly, make urban design and master plan in groups. Finally, design a specific building individually.

The methodical line of approach of the studio consists of 5 steps: Firstly, do research & analysis in L, M, S scales, which is from the country & neighboring area. Secondly, surface water heat pump is available for my floor heating & cooling system because the site is near the harbor and lake. Thirdly, I design the double facade in south elevation to obtain as wide as enough view to enjoy the adjacent healthy natural environment. I take advantage of the wooden floor and ceiling and the sustainable glass curtain wall to break the boundary between interior and exterior space. When people walking inside my building, they could feel the extension of the healthy natural environment.

◆ Relationship between project and wider social context:

In the background research, we found the South Chicago has its own golden age. In 1901, U.S. Steel opened, which became one of the world’s largest steel factories. It attracted many workers, who immigrated here. Later, due to the shifting market of steel, the factory closed in 1992. In 1994, all property are demolished and sold. The site became empty. Workers lost their jobs. The South Chicago declined. So we concluded that the main reason for all the problems in South Chicago is the absent of the economic anchor. And that’s why we decide to introduce a new strong anchor with continuous and stable investment to it.

We also found the support from the government is not the only advantage for Health City. Chicago is a city with solid foundation of health science resource. For example, there are 4 top 100 medical school in Chicago, and 7 of Chicago’s fastest growing companies, 8 of largest companies in Chicago MSA are health-related. However, the applied technology in companies and the academic resource in universities are separated with each other because there is no land available to develop a union base in the downtown. So it is a good choice to develop the south works site, where could provide vast land and healthy natural environment and need new economic anchor urgently, as the Health City project.

In the visit of De-Paul University, I found that an university is almost a guarantee to have a mixed race without any significant social problems since it attracts multiple people. The neighborhood where De-Paul University is was 30 years ago a poor, gang-invested, high crime ghetto area and now it is one of the best neighborhoods in Chicago. De-Paul anchors a lot for that development, the university as a model is one of the best examples here. That conclusion reinforced our decision to make a union campus at the first step of our Health City.

I also found a successful case of Otto Bock in Berlin. The first three floor levels serve as exhibition space with interactive and realistic presentations and simulations of the technically most advanced orthopaedic products. The other floors provide seminar and conference rooms as well as space for consultations between patients, doctors, therapists and technicians. The interaction modes and cooperation with public facilities are good examples for my public health education centre.

◆ Relationship between research and design:

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◆ Relationship between methodological line of approach of the studio and the method chosen by me:

The methodological line of approach of the studio consists of 5 steps: Firstly, do research & analysis in L, M, S scales, which is from the country to the city and then to the site. Secondly, study the SOM’s master plan on the same site. Thirdly, define strategies/ ambitions for the entire site & neighborhood. Fourthly, make urban design and master plan in groups. Finally, design a specific building individually.

I followed the studio structure illustrated above. Firstly, I went to Chicago with the studio and make a solid research and analysis on different aspects. We search lots of information from literature and on the internet. The main work done by me is on the M research booklet. Secondly, our 4 people group try to make a strategy to solve the problems in South Chicago. We chose to build a healthy city here. The strategy design is complex, it is more related to policies, social needs, and financial support than just a urban design. We also make case studies to help us. For example, the Medelin case is a good example to build best things in poorest area, which gives us inspirations. Thirdly, we make urban design depend on our strategies. We analyzed several medical colleges in US and Europe and tried to find some useful reference. Finally, I designed a public health education centre, the first interactive platform in our union campus master plan. And with the guidance of the three mentors, I developed it through architecture program, form, structure, route, and climate aspects. The building focus on the concept of interaction and will respond to our group strategy of Health City in different levels such as the relation with the healthy environment, healthy program and healthy building technology.

◆ Relationship between the project and wider social context:

The project is not only a architecture proposal, but also a social proposal for the future of the South Chicago neighbourhood. It reveals the complexity and difficulty of making a design when the architect is not the only leading character in the process. I am happy with my individual project as the beginning of the new interaction in different hierarchies. It is not only a building on the site, but a symbol of respecting the past memory, breaking the limitation of the heritages, integrating different valuable assets. The relationship between the building, the ore walls and the existing landscape make this design unique for the South Chicago. South Chicago will finally reach its new flourish time with the memory of its past along the route we design for it.
Level 10.000/11.000 floor plan 1:200

Level 8.000 floor plan 1:200

Level 6.000 floor plan 1:200

Public Health Education Centre
Mingjie Ning #4228499

floor area:350㎡
floor area:500㎡
floor area:200㎡
floor area:300㎡
floor area:450㎡
floor area:150㎡