MANUFACTURE COMMUNE

Jingran Lin
4301323
Mentor: Mick van Gemert, Suzanne Groenewold Stengs
10 / 03 / 2016
URBAN STRATEGY
SYMBIOTIC PILSEN
URBAN STRATEGY
SYMBIOTIC PILSEN

CONTENT

1. INTRODUCTION
2. ANALYSIS
3. VISION
4. STRATEGY
5. RESULT
PIlSEN is located south-east of Chicago’s city center.
A LOW-INCOME NEIGHBORHOOD with around 33,000 residents, which are mainly mexican or latino.
The neighborhood is divided in two areas:
A RESIDENTIAL NEIGHBORHOOD and AN INDUSTRIAL CORRIDOR.
CHICAGO’S INDUSTRY

- **EMERGENCE**: 1673-1830
- **CONSTRUCTION**: 1831-1871
- **GILDED AGE**: 1872-1950
- **RECESSION**: 1951-2000s
CHICAGO'S INDUSTRY

RECESSION IN MANUFACTURING

71,800 jobs in manufacturing industry was lost during 2001-2004, and 5,400 jobs during 2009-2011.

THE RECESSION OF MANUFACTURING INDUSTRY HAD THE GREATEST IMPACT ON CHICAGO’S RECESSION, ESPECIALLY IN THE CENTRAL CITY.
Industrial corridors of Chicago

Chicago’s 24 industrial corridors are scattered throughout the city.

Pilsen’s industrial corridor is located along the Sanitary and shipment canal a little south-east of the city center.
INDUSTRIAL CORRIDOR IN PILSEN

22% OF LAND IS VACANT IN PILSEN'S INDUSTRIAL CORRIDOR. around 1,015,700M² in total

DOMINANT INDUSTRIAL SECTORS IN PILSEN by numbers of business
Polluting industries

14% of air emissions in Illinois can be attributed to the industrial sector. Other big sectors are transport and electricity generation, which are also industry related.

Only 2% of energy production is renewable in Chicago.
In Illinois state 5%.

Only 5% of the energy Illinois produces is from renewables energy, if taken in account also bio-fuel.
13% is green energy.
Most energy is produced in a non-sustainable way (95-87%).

30% energy in Illinois is consumed by the industrial sector. This is 1187,6 million BTU.
CONCLUSION AND QUESTION

THE OLD INDUSTRIAL CORRIDORS BROUGHT PROSPERITY TO CHICAGO BUT HAS BECOME THE SOURCE OF PROBLEM OF MANY NEGATIVE IMPACTS FOR PILSEN.

WHAT COULD BE THE POSSIBLE STRATEGY FOR A SUSTAINABLE FUTURE OF PILSEN?
CHALLENGE AND OPPORTUNITY
TRENDS ON HOW INDUSTRY IS DEVELOPING

THE CONSUMER EXPERIENCE
Demand of customer will drive new product introductions.

MASS CUSTOMIZATION
Customization will be general and convenient.

3D PRINTING
Making “on demand” products will be possible.

SUSTAINABILITY IS EVERYWHERE
More efficient manufacturing will drive new levels of sustainability.

REMOTE CONTROL
Mobility today makes it possible to work from a mobile device.

SMART OBJECTS
Smart devices can communicate directly with users.
Old industry

All Departments of one Company are placed in one location for easy management and communication.

New industry

Department can be located remote from each other, partly in residential areas because they require less space and have less noise and air pollution.
Old industry

Traditional industry makes employee travel a long way and time to work.

New industry

New industry can be located in residential area and make employees easier to get to the workplace.
CHALLENGE AND OPPORTUNITY
TRENDS ON HOW INDUSTRY IS DEVELOPING

Old industry

Traditional industry makes employee travel a long way and time to work.

New industry

New industry can be located in residential area and make employees easier to get to the workplace.
Industries in the City Must Be Clean. It must be able to recycle its waste energy, and better yet, regenerate energy for neighboring’s use.

Clean sustainable industries

Mix-use corridors

Industries must no longer be isolated in separate corridors. They must become mixed-use zones with diverse industries that integrate with the city context to prevent blighted and dead-end spaces inside the city. Particularly when automation is taking over labor workforce, these mixed-use areas must intertwine with public programs to keep the areas alive. They must be publicly accessible and house other activities/sectors.
**CONDITION & CHALLENGES: CHICAGO RIVER AND WATER**

Contamination of soil and water

Soil and waterways, like the sanitary canal are heavily polluted along the industrial corridors. Remediation is needed if these site’s want to be redeveloped for non-industrial uses.

During heavy rainfall the sewage system can’t process all the water and has to release storm and sewage-water into the sanitary canal and river.

In 2011, measurements showed that the amount of hexavalent chromium in Chicago drinking water was 11 times more than health standard.

| 0.02 ppb | 0.23 ppb |

- Sewage overflow
- Lack of permeable land

60% built-up land
CONDITION & CHALLENGES:
CHICAGO RIVER AND WATER

- industrial corridor
- public space inside ic
- public space outside ic

lack of public space along waterfront and industrial corridor

Unaccessible waterfront
CONDITION & CHALLENGES: CHICAGO RIVER AND WATER

Challenges

- Polluted soil and river water
- Sewage overflows and lack of permeable land
- Lack of public space along river

Opportunities

- Extend the river-walk to Pilsen
- Clean the river for recreational use and better environment
- Prevent sewage overflows
CONDITION & CHALLENGES: PILSEN NEIGHBOURHOOD

Pilsen is close to city center

Infrastructural barriers that isolate Pilsen from surrounding neighborhoods
CONDITION & CHALLENGES:
PILSEN NEIGHBOURHOOD

Gentrification & art district in east-pilsen

The eastern part of pilsen is in gentrification, many old industrial buildings are transformed into galleries, art lofts or studios. Last decade an art-district has developed within the eastern part of pilsen, attracting new people to the neighborhoods, among many artists and students. Students settle down in pilsen also because of its proximity to university village and the loop.
Within the Pilsen industrial corridor there are many old valuable industrial buildings, since Pilsen has a long industrial history which goes back to late 19th century. Many of those buildings are official industrial heritage. Some of those buildings are currently vacant, but most of them are occupied by new mostly creative & art related businesses.
<table>
<thead>
<tr>
<th>Challenges</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor connection to other neighbourhoods</td>
<td>Connect to other neighbourhoods and public transit</td>
</tr>
<tr>
<td>Preserving industrial heritage</td>
<td>Transform industrial heritage for the creative industry and artists</td>
</tr>
<tr>
<td>Gentrification and art district</td>
<td>Expand the art district and manage gentrification</td>
</tr>
</tbody>
</table>
Conclusion

PILSEN AND CHICAGO NEED A NEW VISION FOR WHAT THE NEXT GENERATION OF INDUSTRIAL CORRIDOR MUST LOOK LIKE, TO ATTRACT AND SUPPORT NEW TYPES OF INDUSTRY AND BECOME MORE SUSTAINABLE.
URBAN STRATEGY
VISIONS FOR FUTURE PILSEN

1. Existing pilsen
   Industrial heritage
gentrification & art
district infrastructural barriers

2. Existing Industry
   Vacancy & decline
   lack of jobs and tax revenues
   large polluting industries

3. Existing Ecology
   remediation of polluted soil & river-water
   energy spilling industries
   sewage overflow & waste problems
   old utility systems

4. existing Connections
   poor connection to loop & surrounding neighborhoods
   Poor access to waterfront
   poor access public Transit
URBAN STRATEGY
FOUR THEMES

Industrial heritage
Gentrification & art district
Little connection between industrial and residential zones

CHALLENGES

Segregation between industrial and residential area.

THREATS

Chicago

Pilsen

Permeable Surface
River Pollution

Waster Recycling

Segregation between industrial and residential area.
The pollution of Pilsen industrial corridor influency the river and the residential area.

Less accessibility to train stations in Pilsen east.
Less accessibility to water and the Pilsen's southern neighborhood.

Vacant spaces limit the potential of the development of Pilsen industry.

RENEWABLE ENERGY

1. EXISTING PILSEN

- Preserve heritage and transform them to anchor-points
- Respond to existing developments in art-district
- Respond to existing grid
URBAN STRATEGY
FOUR THEMES

2. NEW INDUSTRY

Challenges

- Mix-use program
- Creative industry
- Innovative and clean (manufacturing) industry
- Small and medium size enterprises

Strategy
URBAN STRATEGY
FOUR THEMES

Challenges

- Chicago
- Pilsen
- Permeable Surface
- River Pollution
- Waster Recycling
- Renewable Energy

Strategy

- Cleaning the waterfront and industrial corridor
- Local sustainable utility systems
- Green urban landscape
4. New Connections

**Challenges**

- Waterfront as connecting element to loop and other neighborhoods
- Close connection between new industrial area and existing Pilsen
- Support sustainable ways of transport

**Strategy**
CREATING A SYMBIOTIC RELATIONSHIP BETWEEN INDUSTRY, RESIDENTS AND THE ENVIRONMENT

Transform Pilser’s industrial corridor into a livable place within the city

Instead of an industrial area with vacant plots, contaminated soil, an unaccessible waterfront and pollutant industries, we envision a new industrial corridor that becomes A REAL PART OF THE CITY, with next to industry also residential, recreational, cultural and commercial functions along the waterfront. With cleaner and smaller industries which have a better relationship to their environment.
START FROM EAST-PILSEN
- close to the loop and university village
- lots of vacant land
- art-district & gentrification
- lots of industrial heritage
- first part to connect with existing river-park

START FROM VACANT PLOTS
- Start from vacant plots
- Expand developments in art-district
- gradually redevelop industrial corridors step-by-step
- Gradually replace or transform polluting industries

DEVELOPMENT STRATEGY
PHASING OF DEVELOPMENT AND REMEDIATION

PHASING OF REMEDIATION AND DEVELOPMENT

Phase 1:
- East part of Pilsen industrial corridor
- lots of vacant land
- art-district & gentrification
- lots of industrial heritage
- first part to connect with existing river-park

Phase 2:
- West part of Pilsen industrial corridor
- Start from vacant plots
- Gradually replace or transform polluting industries
DEVELOPMENT STRATEGY

DEVELOPMENT IN VERTICAL STRIPS

PHASING IN VERTICAL STRIPS

- Respond to existing grid
- Respond to vertical orientation of plots within corridors
- Allow to Gradually replace or transform polluting industries
- Allows to gradually redevelop and remediate the industrial corridors step-by-step
DEVELOPMENT STRATEGY

REMEDIATION & CONSTRUCTION STRATEGY PER DISTRICT

Demolishing and removing of existing (pollutant) industries over time.
Preserving industrial heritage
Vacant plots can house temporary function before soil remediation.

Bio-remediation (with plants) can provide first green structure along waterfront.
Provide already access to waterfront and industrial heritage while remediating.
In-situ remediation with excavation is faster, so development can start faster.

Per district development phase two utility facilities can be built.
Waste-to-energy plant > energy (potentially also building material) Living machine > water treatment
Utility systems can provide clean energy and water for the remediation process.
First utility infrastructure can be layed out.
Utility system can already start serving Pilsen neighborhood and industrial heritage.
Water treatment can start cleaning the river-water

Extending grid
Define building blocks
First Roads can made
Utility connections (infra) can be developed further

Start construction of building blocks and (cycling) bridge
Supported by energy and water from utilities
Bio-remediation continuous
Maybe also building material (geopolymer concrete) from waste plant.
>> (Gasplasma plant > Plasmarok cement)

Green infrastructure is improved into parks and cycling lanes after bio-remediation.
Cleaning of river water and waste-water continuous.
Waterfront parks becomes connection to other neighborhoods and the city center.
Waterfront Becomes destination for leisure and recreation
Utility systems become fully operational and remain in new urban fabric
Pedestrian/Cycling bridge across Cermak Road
DEVELOPMENT STRATEGY

REMEDIATION & CONSTRUCTION STRATEGY PER DISTRICT

Remediation start on vacant plots + temporary uses
Bio-remediation (micro-organisms) start on vacant plots
Phyto-remediation (with plants) starts at future park areas
Utility facility is placed along waterfront
> deliver first energy and heat for remediation process and Pilsen neighborhood
Demolishment starts of polluting industrial buildings

Further demolishing of existing buildings

Construction is expanded to other plots
Final remediation on remaining plots
Each plot is developed differently creating a programmatic mix within each strip

Start with construction first remediated plots
Utility system also delivers electricity and heat for construction
DEVELOPMENT STRATEGY
UTILITY SYSTEMS AND GREEN INFRASTRUCTURE

- Adding green lanes for water retention and water pre-treatment
- Living machine local waste-water treatment
- Waste-to-energy plant waste recovery electricity and heat
- Wetland park along waterfront to clean river water
We have a sequence of functions from manufacturing to remediation and they will end at the waterfront.

There are sub-divided functions under the preliminary category. We then will discuss the symbiotic relationship or best combination among the sub-functions.
Sub-function and Its Typology

Typologies in relation to different functions

For each sub-divided function there is corresponding building typology.
DEVELOPMENT STRATEGY
SECTION, DENSITY, STREET IMPRESSION

Existing Residential Area
Floor number 1 - 3
Building density: 29%

New Development
Floor number 3 - 8
Building density: 33%

New Development
Floor number 3 - 8
Building density: 40%

Existing Manufacturing
Floor number 1 - 2
Building density: 42%

Existing Residential Area
Floor number 1 - 4
Building density: 39 - 42%

Railway
Waterfront
Canal
Waterfront
Cermark Road
Railway
DEVELOPMENT STRATEGY

ROUTING, CONNECTIONS AND PUBLIC SPACE
MANUFACTURE COMMUNE
This transition included going from hand production methods to machines, new chemical manufacturing and iron production processes, improved efficiency of water power, the increasing use of stream power, and the development of machine tools in the period from about 1760 to sometime between 1820 and 1840.

Also known as the technological revolution, was a phase of the larger Industrial Revolution corresponding to the latter half of the 19th century until World War I. It is considered to have begun around the time of the introduction of Bessemer steel in the 1850s and culminated in early factory electrification, mass production and the production line.

Also called the digital revolution. The change from analog, mechanical, and electronic technology to digital technology which began anywhere from the late 1950s to the late 1970s with the adoption and proliferation of digital computers and digital record keeping that continues to the present day.

Also known as the cyber-physical systems, the internet of things and the internet of things, it facilitates the vision of the smart factory.

A key feature of industry 4.0 are smart factories. The Smart Factory is defined as a factory that is context-aware. It assists people and machines in execution of their tasks. Cyber-physical systems communicate and cooperate with each other and humans in real time via the Internet.
THE NEXT VERSION OF MAKING:
What will the new industrial revolution bring us?

MASS CUSTOMIZATION
- Social media and crowdsourcing
- Online Interactive Product Configurators
- 3D Scanning and Modeling
- Recommendation Engines
- Controlling manufacturing costs
- Enterprise and Production Software
- Flexible Production Systems

3D PRINTING and DIGITAL CONTROLLED MANUFACTURE
- 3D printing becomes industrial strength
- 3D printing starts saving lives
- Customization becomes the norm
- Product innovation is faster
- New companies develop innovative business models built on 3D printing
- 3D print shops open at the mall
- Heated debates on who owns the rights emerge
- New products with magical properties will tantalize us
- New machines grace the factory floor
- “Look what I made!”

THE TIME OF INDEPENDENT DESIGNING AND MAKING IS COMING
NEW LIFE STYLE
NEW CONCEPT OF CONSUMING
ENCOURAGING CREATION

Sharing Ideas
Providing Tools
Education & Research
Serve Local
Sharing Resources
Cross-filed Cooperation

THE NEXT VERSION OF MAKING:
What will the new MAKING change?
FOR WORKING PEOPLE

People working on creating new products will get more TOOLS in an easy way.

SHARING ideas and resources will happen more directly.

Working with people from different fields in the same space will INSPIRE your creation.

FOR THE PUBLIC

SELF-REALIZATION could be achieved during the making of artifact. In the process of making, the nature of one person will be reflected in the object.

People will get JOYS while making.

The CUSTOMIZATION will be possible in more things, and getting articles of daily use will change from choosing products to making it in your own ideas.
A fab lab is generally equipped with an array of flexible computer controlled tools that cover several different length scales and various materials, with the aim to make “almost anything”. This includes technology-enabled products generally perceived as limited to mass production.

While fab labs have yet to compete with mass production and its associated economies of scale in fabricating widely distributed products, they have already shown the potential to empower individuals to create smart devices for themselves. These devices can be tailored to local or personal needs in ways that are not practical or economical using mass production.
THE NEXT VERSION OF MAKING: Program of Fabrication Laboratory

FOR BUSINESSES

Fablab Amsterdam is a fully equipped digital fabrication workshop that gives you the opportunity to develop your ideas and create prototypes for new products.

FOR COMMUNITIES

If you are a community group or an organisation that needs a space to meet and to develop new ideas, build teams or make something incredible, the Fablab is here for you. No matter if you are into arts, crafts, sports or science, everybody is welcome!

FOR SCHOOL

If you’re a school or an educational organisation that needs a space to develop new ideas, get advice on how to enhance technical skills and to build prototypes, the Fablab is the right place for you.

FOR INDIVIDUALS

If you are an entrepreneur or an inventor and want to create products and solve problems or someone with a fantastic idea and you want to realize it quickly, cheaply and easily, then the Fablab is the right place for you. You can reserve a machine at a modest hourly price.
INTENTION OF THE DESIGN

A PLACE FOR DESIGNERS AND ARTISANS TO MAKE THEIR PROTOTYPE OF DESIGN

A PLATFORM FOR DESIGNERS TO SHOW THEIR WORK

A PLACE CAN DESIGN AND MAKE YOUR OWN PRODUCT ON YOUR DEMAND

A PLACE WHERE PEOPLE CAN ENJOY CREATION
ACTIVITIES, PEOPLE AND SPACES
CORRELATION ANALYSIS
Spaces for certain activities:

- 3D printing
- Woodworking
- Metalworking
- Fabric
- Ceramic craft

- Exhibition
- Release conference
- Market
- Collective activity

- Lecture
- Education
- Presentation

- Group work
- Meeting

- Designing
- Working

- Workshop
- Studio
- Collective Space
- Auditorium / classroom
- Meeting Space

- Service/commercial
- Service/management/maintenance

- Third place for work
- Restaurant
- Cafe
- Bar

PEOPLE

- Designer
- Start-up
- Communities
- Individual

SPACE

SPACES FOR CERTAIN ACTIVITIES
PROGRAM
OPERATION MODE

MATTER
Material → Stuffs → Workshop → Designers
Clients

PEOPLE
A → B
A serves B

START-UP

STUDIO
working unit

DESIGNER
- independent
- hired

WORKSHOP
shared making space

COMMUNITIES
- education
- cooperation

COLLECTIVE SPACE
- market
- release conference
- lecture
- exhibition
- etc.

THE PUBLIC
- making things
- consuming

PRODUCT
Product
Waste
Recycled in Material Lab
**Program Space Catalogue**

**Workshop**
Middle to large space for big machine and accommodating products. Also should concern the noise and easy access to outside and workplace.

**Studio**
Small to middle size space for individual and group works. Similar to office space, should be more quiet and private. Rent to Start-up and design teams.

**Auditorium / classrooms**
For public lecture and presentation. For public & communities to use, also education.

**Service: Commercial / storage**
Commercial space includes restaurant, café & bar for working people and the public, also the third workplace. Could also work as shops with products made by people and provides design service. Kitchen and restrooms.

Storage can be close to workshops and studios.

**Collective space**
Large size space. Provide platform for public activities and exhibition. Easy access to other rooms and direct open to main entrance.

**Meeting space**
Space for people to meet and communicate, also cooperation between designers and clients. Could both in public corridor and private rooms.

**Maintenance / management**
Equipments, repairing and storage. Office space for staffs.
ANALYSIS
SUGGESTED LOCATION
LOCATION AND CONNECTION

Located in a point near most of the demands for SHORT TRANSPORTATION

Provide digital fabrication for the CREATIVE INDUSTRY

Provide fabrication for the ART STUDIOS and GALLERIES

Provide customization for THE PUBLIC
PLOT SURROUNDING

West side next to a long green belt
North side faces manufacturing institution
South faces residential blocks and waterfront green
East faces commercial and creative industry buildings

RELATION WITH THE MASTERPLAN
ENVIRONMENT IN THE URBAN LANDSCAPE

NORTH: Green Passage

SOUTH: Waterfront Landscape

What could happen in between?
INTENTION OF THE DESIGN

THE BUILDING SHOULD ACT AS PART OF THE LANDSCAPE.

IT WILL FOLLOW THE INTENTION OF THE URBAN STRATEGY TO IMPROVE THE ENVIRONMENT OF THE AREA.

THE PUBLICITY OF THIS PROGRAM ALSO NEED SPACE FOR VARIOUS EVENTS.
Ansel Adams (1902-1984)

Yosemite Valley (1935)
Ansel Adams (1902-1984)
LANDSCAPE
IN THE UNITED STATES

Yosemite Valley
Cook County
Pilsen
BUILDING AS LANDSCAPE
IN THE URBAN ENVIRONMENT

BRING LANDSCAPE TO THE SITE
THEN THE BUILDING WILL APPEAR

THE LANDSCAPE SHOULD WELCOME
PEOPLE AND LEAD THEM TO THE PLACE

THE BUILDING AND LANDSCAPE WILL
FORM THE PLACE AND EVENTS
The typical urban landscape is a view of vertical buildings perpendicular to the flat ground.

To bring variation and enrich the urban landscape, a different type of landscape will be applied in the forming of the project.

In reference to natural earthen formation, hills and mountains
BUILDING AS LANDSCAPE
FORMING THE PLACE

Urban section: space and distance in between

Typology: building and mounds
Place a mound in the site

Diastrophism happens when the force of flow comes

Giant mound reconstructed into small ones, allow flows going through, and the building happens inbetween
the flow contains people, matters, events, and space. When it affluxes into the site, it will crash, spin and subside.
the content has its body. It will transform into volumes, surfaces and enclosed space. Each space will find its location in the site.
masterplan 1:500
BUILDING AS LANDSCAPE

Program fitting in the volumes
BUILDING AS LANDSCAPE

Program vertical distribution
A ring shaped corridor links all the rooms, the changing size of it makes random events happening, could also be the extension of the function it connects. The ring shape makes the rooms not too far away from each other, and creates opportunities for different activities meet each other. In the corridor, you will have both the views to the inside and outside of the building.
CONSTRUCTION LOGIC

- concrete structure frame
- load-bearing exterior wall
CONSTRUCTION LOGIC

concrete floorslabs and dividing walls

steel structure frame
CONSTRUCTION LOGIC

slope roof and roof veranda

windows and landscape
DETAILING

10mm two safety glass: layers of toughened fibre glass.

separate mullion: glass curtain wall to prevent thermal expansion.

two stainless steel: separate metal mesh panels fixed with stainless steel clips.

Detail C
CLIMATE DESIGN

Ventilation
CLIMATE DESIGN
Rain water collecting
CLIMATE DESIGN
Buffering zone

WINTER
- 15°C
- 20°C
- 20°C
- 20°C
- 18°C
- 18°C
- 18°C

SUMMER
- 33°C
- 30°C
- 28°C
- 26°C
- 28°C
- 26°C
- 28°C
- 26°C

0°C

CLIMATE DESIGN

Energy collecting

UTES (underground thermal energy storage)
THANK YOU!

Jingran Lin
4301323
Mentor: Mick van Gemert, Suzanne Groenewold Stengs
10 / 03 / 2016