GRADUATION PROJECT

"UN Headquarters for Sustainability in New York City"

UNITED NATION ENVIRONMENTAL COUNCIL

Student: Ke Zhang
Tutor: Henri van Bennekom ; Maarten Meijs
research phase

**General Information**
- Location
- Surroundings
- Refine of the site plan
- Original buildings' condition

**Concept**
- Generate & translate a concept into architectural language

**Basic System**
- A basic form of the design

**Detailing**
- The process from a general 2D form to a detailed project

**Final Achievement**
- Plan section facade
- Local design
- Structure & Detail
- Sustainable consideration

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General Information

Location
Surroundings
Refine of the site plan
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United Nations Environmental Council

LOCATION

United Nation Headquarter

Manhattan

Central Park

residential
commercial & offices
government

Midtown East

east river

Concept | Basic System | Detailing | Final Achievement

General Information

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LOCAL CONDITION

Height:
mainly between 50-100m,
about 10 over 100 m

Function:
government, offices, education,
commercial, residential

Green:
large green space around UN,
public space and vacant

Traffic:
grid clear

Typical Buildings

Green around UN
CURRENT CONDITION OF SURROUNDINGS

Current Site Plan

Front side: Not well organized

River side: security problem
1. 1st Avenue: 3 car lanes + 1 bus lane
2. Bus station
3. Green belt with pavilions
4. UN Plaza
5. Podium
6. Exhausting strip
7. Pedestrian ring / FDR drive
Concept

Generate & translate a concept into architectural language
UN Headquarters for Sustainability in New York
UNDERSTANDING SUSTAINABLE

What is sustainable?

How to apply sustainable in Architecture?

Natural

Localized & Native

Expect

Fantastic

Energy

High-tec
The Symbiosis in Development sustainability definition:

"Sustainability, is a state of a complex, dynamic system. In this state a system can continue to flourish without leading to its internal collapse or requiring inputs from outside of its defined system boundaries."

A.N.A Bosschaer & E.M. Gladek. 2010
phenomenology

Franz Brentano

Edmund Husserl

Heidegger

Maurice Merleau-Ponty

Dwelling thinking

body subject

Peter Zumthor

Steven Holl

Experience in an System

Therme Vals

"Horizontal Skyscraper"

Small scale Object & Materials

Large scale Sequence of tour
Living thought

At the larger geographic scales, issues emerge such as landscape character and the sequences of various journeys.

At the scale of a building, the concern may be with privacy, ease of access and visual quality.

At the level of furniture, people may be concerned with sitting, dining, talking and so forth.

REFERENCE & KEY WORDS OF THE SYSTEM

Reference System- liked Architecture

**Compound Indicators**

*Efficiency*  *Reliability*  *Cohesion*

**Representing Indicators**

*Connectivity*  *Diversity*  *Complexity*  *Flexibility*
**NEW BUILDING IN THE SYSTEM**

<table>
<thead>
<tr>
<th>Form</th>
<th>rather than</th>
<th>Image</th>
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<tr>
<td>Type</td>
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Based on the surroundings
INTO 2D ABSTRACT MODEL

Site Condition

New master plan - A platform of UN

Abstract 2D Model
System Type

Isolate

Image of system - Courtyard
(Without well organised)
Simplify the unorganized system

- Far
  - Inner Garden

- Medium
  - Both
  - Next to
    - Public Park

No public
Block

- courtyard
  - good outdoor environment
  - no large space inside
  - position of the boundary
  - much possibility of indoor space
  - too artificial
  - strong architectural image
- block
  - Different indoor function based on the shape, organic
  - Indoor quality
  - New possibility of indoor & outdoor junction
- multi storey & low-rise
  - Different indoor function based on the shape
  - Indoor quality
  - Small standard floor for high-rise
  - New possibility of indoor & outdoor junction
- tower
  - Isolate
BASIC SYSTEM

P+2P  Park+parking (underground) & potential
B    Buffer, another natural medium
N.B  New building area
O.B  Original building

Multi-storey & low-rise layout
Detailing

The process from a general 2D form to a detailed project
Basic layout

Position finding of new building
Multi-rise part
MULTI-RISE POSITION COMPARISON

Destroy the facade image

Too close

range of choice

the general assembly building facade
Multilayer Position

Lowrise & buffer natural source
1st fail

2nd involve entrance

3rd double-floor interior

mid-term unclear junction & icon representing
Diversity  Complexity  Flexibility
system-like building layout  modern type  strong icon representing
with nature  with original building  with surrounding  clear junction
Sequence of Tour  Material & Object  Interior Feeling
Final Achievement

Plan section facade
Local design
Detail
Sustainable consideration
structure simplified & optimized
Two parts of the new building
Baseline part connect with the front square and the general assembly building
Multi-storey part as one component of the original buildings
Lake as the central of the new designed area
VIEW FROM THE CITY SIDE

View from the city side - clear sequence of tour & rich experience
view when enter new UN area - already on the new building
MAIN FACE OF UN

structure 2D

structure 3D
view from public park

view on the roof

view out of the entrance of the new building
Indoor System with original buildings
the organization of basement -1 form outdoor to interior
natural buffer zone from outside to inside
SUN SHADING AND VENTILATION OF THE ENTRANCE

- retractable glass curtain wall
- sunshading - louvre
- glass curtain wall

shadow condition of this area
Concrete structure system: high fire resistibility. Contact the original structure system.
PLAN OF BASEMENT -1

-4.500 (outdoor)

-4.900 (water tank)

-9.400 (stream)

-4.500 (entrance area)

-4.500 (basement)

entrance for new building

entrance for new UN area

to the park area

to general assembly

up to the roof

installation (ventilation)

entrance (general)

meeting room (general: 230m²)

archive (general)

installation (general)

meeting room (general: 260m²)

storage

office (general)

office (general)

office (general)

office (general)

office (general)

exhibition area

information desk

ICT

lounge

lounge

shop

card machine

Exposition

Exposition

to connect to original

N

plan of basement -1
outdoor path

basement -1 plan of the entrance part

General Information | Concept | Basic System | Detailing | Final Achievement
--- | --- | --- | --- | ---
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BASEMENT -2

the organization of basement -2

- parking area
- lake (-4.900)
- channel (-9.400)
- office (-10.000)
basement -2 plan of the entrance part
natural feeling of the channel and the outside of the office
image of the multi-storey part - facade of council chamber draw attention
Plan of the multi-storey part -1

Image of the multi-storey part (-1) - facade of council chamber draw attention
the relationship between the council chamber and surroundings
outside of the council chamber - waterfall, channel, green facade, glass curtain wall
INTERIOR OF THE COUNCIL CHAMBER

interior of the council chamber - tree & natural feeling
section of the council chamber - tree idea - direct image with sustainable
TREE IDEA OF THE COUNCIL CHAMBER

outer facade

inner facade
all enjoy idea of the council chamber - when there is a meeting
all enjoy idea of the council chamber - when no meeting
MACHANICAL VENTILATION

pipes - air let in

pipes - air let out

machanical ventilation - hiding pipes
main structure of the facade

column
1200*1200

column
1200*1200

council chamber facade

1. green facade
2. concrete wall
3. truss
4. inner timber facade
5. ventilation pipe
6. louvre boards
7. spot helded glazing, toughened glass
7. steel truss
8. rolling screen
9. timber inner wall
10. timber cover panel
11. steel column
   200*100 mm
12. suspension vertical rod
13. horizontal steel plate
14. cable for the stability
15. glass spot holder
16. interior concrete wall

1. the outline of the office facade part
2. vertical plants
3. prefabricated panels of 1200*1050 mm, made of perlite, peat, and vegetal fiber
4. insulation layer 150 mm
5. concrete wall 150 mm
6. vertical keel
IMAGE OF THE RETRACTABLE GLASS CURTAIN WALL

vertical section

facade image

horizontal section
DETAIL OF THE RETRACTABLE GLASS CURTAIN WALL

horizontal section

1. steel column 200*100 mm
2. suspension vertical rod
3. horizontal steel plate
4. cable for the stability
5. glass spot holder

vertical section
DETAIL OF THE RETRACTABLE GLASS CURTAIN WALL

- **Close**
  - rubber
  - rotation shaft

- **Open**
  - rubber
  - rotation shaft
GENERAL OFFICE FACADE

- grey stone composite board (rough)
- second skin: glass facade
- rolling screen
- first skin: large windows fair justice open attitude of UN

image of the office facade

vertical section of this area
1. external facade  
2. sunshading  
3. internal windows with vents on top and bottom  
4. Breedplaatvloer (wide plate floor) with pipes inside (hollow core activation system)  
5. water pipe under the floor for extra cooling and heating  
6. air outlet  
7. air inlet  
8. ceiling
1. Inwardly opened window
2. Grey stone composite board (rough)
3. Ventilation opening
4. Sun shading
5. Column

Details:
- **Detail A**: [Diagram of Detail A]
- **Detail B**: [Diagram of Detail B]
- **Detail C**: [Diagram of Detail C]
INTERIOR OF THE MULTI-STOREY PART

different quality of three large space

- auditorium (600 m²)
- green roof of auditorium (400 m²)
- atrium
- council chamber
new area (FDR drive before)

-9.400 (stream)
-9.0100
(expansion)

tank

basement -2 - facility

-4.500
(parking)

-9.400
(stream)

0.000
(roof of basement)

ground floor - propagate office delegate lounge

press room

1st floor - produce office

produce office

auditorium (100 m²*2)

brainstorm rooms

2nd floor - library

heating buffer zone from the roof
sustainable consideration -
natural light & air from skylight
air inlet & outlet on the roof (hide)
solar panel on the roof (hide)
water tank underground (hide)
MACHANICAL VENTILATION

- Machanical ventilation - hide air inlet & outlet on the roof or next to the courtyard.
overall review & sustainable solution - feel and perceive natural source & hide high-technic
VIEW ON TWO DIRECTION OF THE SYSTEM

front view of UN

section of UN from city side to river side

FDR drive  expedition: tank: new  presentive part  lake: platform: general assembly  entrance bar  fence  linear square  1st Avenue

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Dynamic System
Architectural Form
Connectivity
Experience

Diversity
Complexity
Flexibility

system-like building layout
modern type
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Sequence of Tour
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