United Nations Environmental Council

SADD-----P4 presentation

4116542 Jiran Ma
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Mission

The United Nations

A New Headquarters for the United Nations Environmental Council
City jungle of New York City
Looking for places for relax

Highline Park

Central Park
Key Value: Slowing Down
Chapter 1  Research
Research of the Public space and Green area in Manhattan
Public space goes vertically
New York form of “PUBLIC”
New York form of “PULIC”

Street Level

Traffic & Circulation
New York form of “PULIC”

Spaces around the street level– Sunken Plaza

High quality outdoor public space

Rockefeller Plaza
Spaces around the street level—Elevated space

Leisure, far from the crowd

Lincoln Center rooftop lawn

Highline Park
Spaces on higher level—Rooftops

Semi-Public, collective space

Rockefeller Center rooftop garden

New York form of “PULIC”
New York form of “PULIC”

Spaces on higher level—Setbacks

Enjoy the view of the city

INK48 Restaurant
New York form of “PUBLIC”

Open the ground level—Privately Owned Public Spaces

Inside public spaces for the dense urban context

IBM Building

J.P Morgan
Conclusion of the Research of public space

Public spaces of high quality go sometimes vertically

Public spaces at different heights

Interior Public spaces--Privately own Public spaces
Urban context of the **Current Situation**
UN Complex
Manhattan

Missing link of the green belt

UN Compound
Current Situation -- Greens

No large open area and greens
Current Situation-- Traffic
Current Situation-- Security
Urban context of the Design Location
Design Location
Conclusions of New Master plan
Users:

• Delegates
• Employees
• Tourists
• People from neighborhoods
Proposal Character of the Location

- **Destination**
  - Socialize, eat, shop, view art, attend programmed activities, event

- **Natural**
  - Hidden garden

- **Civic**
  - Open air concourse or square

- **Office**
  - Building

- **Urban Plaza Brief stop**

- **Gathering, Agora**
  - Waterfront square

- **Sports**

- **Fun**
Chapter 3  Concept and Form Investigation
Concept

*Life in New York City means slowing down*

**Public life at different heights**
Strategy

Public – Security
Organize the public spaces
Form Investigation
Why high approach?

New York Slabs
Essence of the Manhattan
Exploration of site form
Site Development
Site Development

1st Ave.

47th Str.

8m
Building Development
Building Development

- Conventional Slab: central stiff core
- Two Slabs with light atrium: side stiff cores
- Vertical greens for views, light and ventilation
- Adapt the system to orientations
Building Development

Flexibility & Views

Conventional Slab
central stiff core

Two Slabs with light atrium
side stiff cores

View is blocked by cores

Clear diagonal view throughout the entire office space
Building Development

Sun orientation in Manhattan

- Summer sun: 71 degrees
- Spring/fall: 49 degrees
- Winter sun: 25 degrees

The solar gain is being blocked in the atrium in spring/summer
Conclusion of building in the urban situation
Chapter 4  Location & Approach the building
Characters of the places

Characters 1 Plazza San Marco

Characters 1 La Defense

Characters 2 Rockefeller Plaza
Characters of the places

Characters 3 Paley Park

Characters 4 Times Building atrium

Characters 4 Ryuan Temple
Visiting routes
Approach the building from 1\textsuperscript{st} Ave.
View from the 1st Ave.
View from the side of the location
View from the square
View from the square
View the city at the entrance
Chapter 5 Building Design
Program analysis
Arrange gardens in the building
Structure of the Building
structure
Principle of Climate Design
Sun orientation in Manhattan

- Summer sun: 71 degrees
- Spring/fall: 49 degrees
- Winter sun: 25 degrees

The solar gain is being blocked in the atrium in spring/summer.
Direct solar radiation through out the sky garden

**SUMMER:**
The solar gain is being blocked in the atrium in summer

**SPRING / FALL:**
The solar gain is being blocked in the atrium in spring / fall

**WINTER:**
More direct solar radiation gain in the atrium
Principles of installations

Need for Installations in UN Building

Double system: Atrium is a separate unit in the building

Atrium → Air system → Fresh air → cooling

Auditoriums

Ventilation system → air system

Office space

Raised computer floor

Cooling (summer) → draw the temperature from river

Heating (winter) → Geothermal energy from the soil

Exchanger → distribution to the floors (pipes)

Floor system A

Floor system B
Installation of whole building
Air system of the atrium
Air system of the office

Air supply

Air return
Chapter 6  Lower part of the building
View from city
Entrance Hall
Public living room
View from Library
Lower part of Atrium
View to the press room
Chapter 7  Higher part of the building

Atrium
Standard Office
Sky garden
Overview of the to higher part
Atrium Design
Atrium facade
Atrium—view to the city

Atrium—view to the sea
Overview of the sky garden
Sky Garden Analysis

SUMMER:
Direct solar radiation is blocked by cantilever atop

SPRING / FALL
Deciduous trees protect Expo area from direct solar radiation

WINTER
More direct solar radiation gain in the Expo area and atrium
Construction of Sky Garden
Exposition room in the sky garden (sunken)
Forest office in the sky garden
Standard office design
Overview of the office
Flexibility: Options of the layout of standard office area

100% cell offices

100% open plan offices

Mixed offices
Climate in Office

Double system---------Floor heating/cooling & Air ventilation system

South

Spring
Fall
5-22 °C

Summer
>23 °C

Winter
-10 °C

Atrium
Spring / Fall

- Main: Natural ventilation
- Air supply in need
Summer/ Winter

Water radiator Cooling/ Heating
Cool/ Warm air in extreme need

Summer
>23°C

Winter
-10°C
Office facade

• Reduce energy consumption
• Natural light—sun shading
• Natural ventilation– adapt the individual differences
• view to the outside
Overview of south facade
Ratio of close and open relate to the energy consumption

50% Closed area VS 50% Glass area
Division of functions of the façade panel

- Sun shading
- Views
- Ventilation
Specific facade design in relation to the sun orientation

Front shading system

summer sun 1pm

winter sun 1pm

spring & fall 1pm

Blinds between the glass panels
Divide into Prefabricated panels
Prefabricated elements

Transport the façade elements to the site and assembled in site
Overview of one panel
Internal part
Prefabricated panel come from outside

Internal part which installed from inside

Vertical line
prefabricated panel construction sequence

cold-formed steel back up structure
batt insulation in structure
moisture barrier
3-layer thermal glasses
blinds between the glass panels
ventilation vents in structure
profile to support outer layer
high alloy steel outer layer
Lift to the certain height
Connect to the primary structure

close the prefabricated panel to the primary structure
Install the internal part

install the internal part with openable ventilation panel
Install the vertical post
Façade construction sequence
Façade construction sequence
View from the office to the city
Conclusion about the principles of Sustainability
• Strategy of Compact Building

• Strategy of Flexibility within the building

• Strategy of Specific Building Design in relation with sun orientation

• Strategy of Specific Façade Design

• Strategy of Natural air ventilation in the building

• Strategy of Heating and Cooling System
Strategy of Compact Building

Compactness of the building = \frac{Envelop of the building}{square meters floor plan} = 75%  
75% relatively good
Strategy of Flexibility within the building

100% cell offices  100% open plan offices  Mixed

Structure
Strategy of Specific Building Design in relation with sun orientation

Sun orientation in Manhattan

The solar gain is being blocked in the atrium in spring/summer
Strategy of Specific Façade Design
Strategy of Natural air ventilation in the building (Atrium)
Summer/ Winter

Strategy of Heating and Cooling System

Water radiator Cooling/ Heating
Cool/ Warm air in extreme need
THANKS