Design for the

United Nations Environmental council
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The project:

Design the United Nations Sustainability Headquarters

THE WORLD NEEDS LEADERSHIP ON ENVIRONMENTAL SUSTAINABILITY
the location
Manhattan

Site in relation to the city

Midtown East
UN complex
UN complex
the Master plan
Goals for the Urban Master plan

- create a connection to the waterfront from the city
- Make a green waterfront
- create a more accessible waterfront
- Create Unique places for the city
- expand the public life
- visual connection with the waterfront
NYC plan for a green waterfront Manhattan

2020

2012
NYC plan for a green waterfront

current situation **east side**

[Image of the east side showing a busy highway with buildings in the background.]

current situation **west side**

[Image of the west side showing a green path with trees and a running person.]

ASSIGNMENT: UNITED NATIONS
LOCATION: MANHATTAN, NEW YORK CITY

**MASTERPLAN:**
- CLIMATE
- FACADE

**CONDITIONS:**
- VISION
- PROGRAM BRIEF

**CONCLUSION:**
- 1ST AVENUE
- FDR EAST RIVER HIGHWAY
- 48ND STREET
- 42ND STREET
-اسبورت بنيكلاين
- GRAND CENTRAL
- TIMES SQUARE
- ROCKEFELLER CENTRE
- TIMES SQUARE
- HAMMARSKJOLD PLAZA
- UNITED NATIONS HEADQUARTERS
UN complex current situation

Heavy traffic around complex
New urban situation

extend waterfront into east river
New urban situation

Make a new green pedestrian zone around the complex
New urban situation

Reduce car traffic by placing 1st avenue & FDR drive underground
New urban situation car traffic

- East river
- Extended waterfront
- Re-use of old FDR tunnel
- Parking tunnel
- United Nations Environmental council plot
- Character green, slow traffic, park, 24 H public
- 1st Ave zone & tunnel
- pedestrian & slow traffic
- East 47th green zone

- New FDR tunnel
- New 1st Avenue tunnel
New urban situation car traffic

old FDR Highway

old 1st avenue

new FDR Highway

new 1st avenue
Goals for the Urban Master plan

- NYC character
- Neighborhood Typology
- Large Public spaces in Neighborhood
- Main pedestrian routes
- Create Unique places for the city
- New public square
Urban Jungle + Special places
Typology Midtown East

Commercial

offices & retail
Besides commercial buildings, the residential buildings also hold a significant proportion in this area. The mixed residential and commercial buildings are highlighted in the map. The map shows different types of residential and commercial use, including multi-family residences and residential & commercial use.
Lack of large public squares in the area
Main pedestrian routes
Main pedestrian routes going to the site

1. 65%
2. 20%
3. 20%
New Special outside rooms

Create special outside rooms adjacent to the main pedestrian route
New Public square

Extend pedestrian route through the site to the waterside
Building Design starting points
DEVIDING THE PLOT

DIVIDE & DESIGN A SQUARE WITH BUILDING ON RIGHT SIDE
MAKE A **STRONG BASE** THAT ENDS THE PLOT

CONTINUE THE UN BASE AND MAKE A **STRONG END PIECE**
CREATE TOWERS ON THE CORNER

VIEWS - COUNTERPART EXISTING TOWER - NO SHADOW ON PLOT - GOOD SUN ORIENTATION
design steps
design location
creating a base
adding a separating layer
create a tower
splitting for natural light
lower one part as a gesture to UN complex
include special places to gather
view from the east river
view from the east river
building program
Dividing the program brief

PUBLIC
-470 m²
9.3%

SEMI-PUBLIC
2100 m²
13.3%

PRESS & BUSINESS +
4790 m²
30.2%

DELEGATES +
5594 m²
33.3%

EMPLOYEES
1820 m²
11.5%

UNEPC PROGRAM BRIEF
SORTED BY USERS
tourist
delegate
employee
press
auditorium's
typical office floor
typical office floor tower
Sequence of space

Slow extracting route
Entrance of first outside room
walk trough the first room
walk trough the second room
enter the main square
Sequence of space

Fast Direct route
first view of the building
pedestrian choice for direct or slow
first view of the square
Entry square / view of building and waterside
standing on the square with view of building and waterside
view of square / building entrance / waterside
focussing points of the building
base
Entrance lobby level 0

experience building in a tectonical way

clear overviews

passage
Entrance lobby level 1

Clear presentation of buildings cores
sky rooms
sky lobby floor

Meet

Lunch

wifi

have a break
sky lobby floor

Gather

views

communicate
sky lobby floor
office floors
typical floor
landing zone

heart of the building

circulation

meeting

communication
meet & greet zone

soft conversation area

informal meeting

contact with atria
office corridor

intermediate area between circulation & office
office spaces

view on the city or water side

cell planning or open office
Building Cross section
Technical floors
Fresh air input
Atrium & small sky lobby zone
Large sky lobby zone
Base zone
Office zone's
Cycles through the building
External sun protection
General climate concept

**Underfloor Air Distribution**
- Heat and pollutants concentrated at ceiling away from breathing zone
- Ventilation air enters breathing zone first

Variable speed supply fan

- Cooling coil
- Filters
- Control dampers
- Outside air inlet
- Return air bypass
- Return air grille
- VAV or Passive Diffuser
- Access floor 12" FFH
Large sky lobby zone

summer situation

winter situation
Office zone’s

winter situation

summer situation
prefabricated facade constructed with fcs wooden frames

bubble deck flooring system reduces the amount of concrete with 40 %

closed climate ventilation system with 80 % of reusable energy

natural daylight entering deep into the building

recycled composite plastic for whole building facade

external suns shading reducing energy load with 40 % in comparison to traditional office building

vertical fins that reduce the sun penetration

recessed windows that reduces sun penetration

several installation spaces throughout the whole building that reduces the duct lengths

bubble deck flooring system reduces the amount of concrete with 40 %

natural air inlets in the sky rooms to pre/heat or cool the building air supply
facade design
Reducing the energy demand through facade design

Triple glazing with low E coatings

Energy demand

Glazing %

Percentage of glazing in façade

Specific primary energy demand [kWh/m²a]

- Heating
- Cooling
- Artificial lighting
- Ventilation unit power supply
representative fragment
representative fragment

A

B
CALCULATE RATIO

60 % closed

40 % glass
reduce cooling load by recessed windows
reduce cooling load by fixed vertical fins
Structure of the building
building site
base floors
base structure

column and beam structure with load bearing facades
table structure

column and beam structure
vertical cores
tower floors

Bubbledeck floors - no beams & 40% less material
tower structure

column and beam structure
sky lobby's
prefab facade

prefab facade with wood & recycled plastic
prefab vertical’s

vertical sunshading from recycled plastic
optimize in construction
step 1: Floors slab
step 2: fixing brackets
step 3: wooden frame
step 4: insulation
step 5: moisture barrier
step 6: vertical ribbes
step 7: horizontal stems
step 8: recycled composite plating
step 9: recycled composite plating
step 10: repeat
step 11: add recycled composite fins
Elevations
detailing
Main facade detail
floor and ceiling structure
fixing and insulating
prefab element
second prefab element
Conclusion of the Design

- Added special urban spaces
- Expansion of large public squares in NYC
- Added authoritarian building to UN compound
- Leaving the personal comfort zone
- New insights in designing a high-rise building