PRESENTATION OUTLINE

ASSIGNMENT
MASTERPLAN
PRINCIPLES
BUILDING VOLUME
DESIGN
CONSTRUCTION
FAÇADE
INSTALLATIONS
Design a sustainable building that houses the Environmental Council of the United Nations in the urban context of the current UN site in Manhattan, New York. The building will represent the necessity for a sustainable environment.
UNITED NATIONS ENVIRONMENTAL COUNCIL

WORLD PEACE
HUMAN RIGHTS
INTERNATIONAL SECURITY
ECONOMIC DEVELOPMENT
SOCIAL PROGRESS
UNITED NATIONS ENVIRONMENTAL COUNCIL

THE ENVIRONMENT
THE PROGRAM

| PUBLIC AREA  | 1500 m2 |
| AUDITORIA & MEETING | 2700 m2 |
| COUNCIL ROOM | 1400 m2 |
| LIBRARY & EXPOSITION | 1600 m2 |
| RESTAURANT & FOYER | 2300 m2 |
| OFFICE | 5800 m2 |

TOTAL
15.300 m²
**USERS OF THE BUILDING**

- **DELEGATES**
  - Council Room: 1400 m²
- **BUSINESSMEN**
  - Auditoria & Meeting: 2700 m²
- **PRESS**
  - Restaurant & Foyer: 2300 m²
- **EMPLOYEES**
  - Office: 5800 m²
- **PUBLIC VISITORS**
  - Library & Exposition: 1600 m²
  - Public Area: 1500 m²
LOCATION NEW YORK

MANHATTAN

QUEENS

BRONX

BROOKLYN

STATEN ISLAND

NEW JERSEY
ANALYSIS OF **MIDTOWN EAST**

THERE IS A SHORTAGE OF PUBLIC GREEN
ANALYSIS OF MIDTOWN EAST

THE FDR DRIVE IS A LARGE SECURITY RISK

THE FDR DRIVE ACTS AS A BARRIER TO THE WATERFRONT
ANALYSIS OF MIDTOWN EAST

THE CURRENT SITUATION DOES NOT COINCIDE WITH THE LONG TERM PLAN OF A CONTINUOUS WATERFRONT GREEN WAY

1. To create a continuous waterfront greenway on the shoreline of Manhattan
2. To increase the accessible waterfront over the next 10 years
3. To improve the existing waterfront esplanades in Manhattan
4. To improve access and connections to the waterfront for pedestrians and cyclists
MIDTOWN EAST MASTERPLAN
MIDTOWN EAST MASTERPLAN
MIDTOWN EAST MASTERPLAN

Assignment

Principles

Building Volume

Design

Construction

Facade

Installations
ANALYSIS OF THE UN PLOT

THE UN PLOT IS INTROVERT
ANALYSIS OF THE UN PLOT

THE UN PLOT BLOCKS THE CONNECTION WITH THE EAST RIVER
ANALYSIS OF THE UN PLOT

THERE IS NO PROPER AREA FOR THE PUBLIC TO UNDERGO A SAFETY CHECK
URBAN PRINCIPLES

HORIZONTAL ORIENTATION OF BUILDING

THE NEW BUILDING CREATES A PUBLIC AND OFFICIAL AREA
BUILDING PRINCIPLES

CREATING LESS BUILDING VOLUME BY BUILDING UNDER THE GROUND

OPEN APPEARANCE
SUSTAINABLE PRINCIPLES

LIMIT THE AMOUNT OF FACADE AREA
CREATE A TRANSPARENT FACADE FOR PASSIVE SOLAR ENERGY
USE LOCAL AND REUSEABLE MATERIALS AS MUCH AS POSSIBLE
URBAN DIAGRAM

THE NEW BUILDING CREATES TWO AREAS
URBAN DIAGRAM

HORIZONTALLY ORIENTED BUILDING THAT ESCORTS THE PIER TO THE RIVERSIDE
BUILDING VOLUME DIAGRAM

BUILDING UNDER THE GROUND
BUILDING VOLUME DIAGRAM

CREATING A GREAT COMPOSITION WITH THE EXISTING UN
BUILDING VOLUME DIAGRAM

THESE THREE PRINCIPLES COMBINED
BUILDING VOLUME DIAGRAM

RESTORE THE HORIZONTAL ORIENTATION
BUILDING VOLUME DIAGRAM

TRANSFORM IT INTO A TRIANGULAR SEGMENTED ELEMENT WITH AESTHETIC QUALITY THAT ALSO ALLOWS FOR ADJUSTMENTS TO THE SHAPE
BUILDING VOLUME DIAGRAM

CREATING A PUBLIC ENTRANCE
BUILDING VOLUME DIAGRAM

CREATING DAYLIGHT IN THE BASEMENT
BUILDING VOLUME DIAGRAM

CREATING A WATER BASIN AROUND THE BUILDING FOR SECURITY AND REUSE
SITUATION DRAWING
VIEW FROM FIRST AVENUE
LONGITUDINAL SECTION
VIEW OF THE ATRIUM
VIEW OF THE ATRIUM
CROSS SECTION
CROSS SECTION
PLAN FIRST LOWER LEVEL
VIEW OF THE PUBLIC ENTRANCE
VIEW IN THE COUNCIL
PLAN FOURTH LEVEL
DIAGRAM ESCAPE ROUTE & FIRE COMPARTMENT
CONSTRUCTION CONCEPT
CONSTRUCTION CONCEPT
CONSTRUCTION COLUMNS & STABILITY

STEEL HEA 400 mm PROFILES
CONCRETE WALLS FOR STABILITY
CONSTRUCTION BEAMS

STEEL IFB 400 mm PROFILES FOR THE FLOORS
STEEL IPE 400 mm PROFILES FOR THE ROOF
CONSTRUCTION FLOORS

PREFAB CONCRETE HOLLOW-CORE SLAB FLOOR 260 mm
STEEL ROOF 210 mm
CONSTRUCTION DETAIL
VIEW OF SOUTH FACADE
SOUTH FACADE
SOUTH FACADE: SECOND SKIN FACADE

ALLOWS FOR A FULLY TRANSPARENT APPEARANCE WHILE USING NATURAL VENTILATION

THE CAVITY INCREASES THE INSULATIVE VALUE OF THE FACADE

SAVES ENERGY FOR LIGHTNING

GREAT COMFORT FOR EMPLOYEES, BECAUSE IT CAN BE ADJUSTED BY THEMSELVES

SAVES ENERGY ON VENTILATION

PREVENTS WIND DISCOMFORT AND CAN BE OPENED AT NIGHT
SOUTH FACADE: SECOND SKIN FACADE

SPRING & FALL

NATURAL VENTILATION
SOUTH FACADE: SECOND SKIN FACADE

SUMMER: NATURAL VENTILATION

SUMMER: NATURAL VENTILATION
SOUTH FACADE: SECOND SKIN FACADE

WINTER

WINTER
SOUTH FACADE 1:20
SOUTH FACADE DETAIL
WEST FACADE
EAST FACADE FIBER CEMENT PANELS
EAST FACADE 1:20
EAST FACADE DETAIL
VENTILATION DIAGRAM

- NATURAL VENTILATION BY WINDOW
- DEMAND DRIVEN AIR TREATMENT (EG. VAV-system)
- EXHAUST VENTILATION

HEAT EXCHANGER
HEATING DIAGRAM

FLOOR HEATING

HEATING BY AIR (VAV-SYSTEM)

CLIMATE CEILING POSSIBLE BACKUP

HEAT PUMP

VERTICAL CLOSED LOOP SYSTEM
COOLING DIAGRAM

- CLIMATE CEILING
- COOLING BY AIR (VAV-SYSTEM)
- FLOOR POSSIBLE BACKUP FOR COOLING

HEAT PUMP

VERTICAL CLOSED LOOP SYSTEM
QUESTIONS?
SUSTAINABILITY CONCLUSIONS

DURABLE BUILDING

- AESTHETIC QUALITY
- FUNCTIONAL
- FLEXIBLE FLOORPLANS

USE OF NATURAL RESOURCES

- BUILDING IN THE GROUND (REDUCES ENERGY LOSS)
- REUSE OF RAINWATER
- GENERATING TIDAL ENERGY
- CREATING ATRIUM FOR MORE DAYLIGHT
- USING PASSIVE SOLAR ENERGY (SECOND SKIN FACADE)
- USING GEOTHERMAL ENERGY (VERTICAL LOOP SYSTEM)

USE OF SUSTAINABLE MATERIALS

- USE OF LOCAL MATERIALS (FACADE PANELS)
- USE OF REUSABLE MATERIALS (STEEL CONSTRUCTION ELEMENTS)
FLEXIBILITY
SUSTAINABILITY CONCLUSIONS

DURABLE BUILDING

- AESTHETIC QUALITY
- FUNCTIONAL
- FLEXIBLE FLOORPLANS

USE OF NATURAL RESOURCES

- BUILDING IN THE GROUND (REDUCES ENERGY LOSS)
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- USING GEOTHERMAL ENERGY (VERTICAL LOOP SYSTEM)

USE OF SUSTAINABLE MATERIALS

- USE OF LOCAL MATERIALS (FACADE PANELS)
- USE OF REUSABLE MATERIALS (STEEL CONSTRUCTION ELEMENTS)
Precipitation 1260 mm a year

Evaporation 12000 m³

Collected Rainwater 19000 m³

6500 m³ needed for toilet flushing

Evaporation 12000 m³
SUSTAINABILITY CONCLUSIONS

DURABLE BUILDING

- AESTHETIC QUALITY
- FUNCTIONAL
- FLEXIBLE FLOORPLANS

USE OF NATURAL RESOURCES

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USE OF SUSTAINABLE MATERIALS

- USE OF LOCAL MATERIALS (FACADE PANELS)
- USE OF REUSABLE MATERIALS (STEEL CONSTRUCTION ELEMENTS)
GENERATING **TIDAL ENERGY**

THE BUILDING NEEDS 1,325,000 kWh OF ELECTRICITY PER YEAR (170 kWh PER M2).

ONE TIDAL TURBINE IN THE EAST RIVER DELIVERS 65,000 kWh PER YEAR (PROJECT REFERENCE).

21 TIDAL TURBINES ARE NEEDED.
SUSTAINABILITY CONCLUSIONS

DURABLE BUILDING

- AESTHETIC QUALITY
- FUNCTIONAL
- FLEXIBLE FLOORPLANS

USE OF NATURAL RESOURCES

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- USING GEOTHERMAL ENERGY (VERTICAL LOOP SYSTEM)

USE OF SUSTAINABLE MATERIALS

- USE OF LOCAL MATERIALS (FACADE PANELS)
- USE OF REUSABLE MATERIALS (STEEL CONSTRUCTION ELEMENTS)
GEOTHERMAL ENERGY

22 STANDING COLUMN WELLS ARE NEEDED FOR A BUILDING OF 26500 m² (PROJECT REFERENCE)

INVESTMENT COSTS ARE EARNED BACK IN 9 YEARS
SUSTAINABILITY CONCLUSIONS

DURABLE BUILDING

- AESTHETIC QUALITY
- FUNCTIONAL
- FLEXIBLE FLOORPLANS

USE OF NATURAL RESOURCES

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- USING GEOTHERMAL ENERGY (VERTICAL LOOP SYSTEM)

USE OF SUSTAINABLE MATERIALS

- USE OF LOCAL MATERIALS (FACADE PANELS)
- USE OF REUSABLE MATERIALS (STEEL CONSTRUCTION ELEMENTS)
ESCAPE ROUTE & FIRE COMPARTMENT
DIAGRAM ESCAPE ROUTE & FIRE COMPARTMENT