United Nations Environmental Council
A platform for sustainability
CONTENT

WHAT / WHY / WHERE

MASTERPLAN

UNEC DESIGN
WHAT / WHY / WHERE

MASTERPLAN

UNEC DESIGN
WHAT / WHY / WHERE
WHAT / WHY / WHERE
WHAT / WHY / WHERE
WHAT / WHY / WHERE

COLLECT communication EXCHANGE
WHAT / WHY / WHERE
WHAT / WHY / WHERE
WHAT / WHY / WHERE
WHAT / WHY / WHERE

MASTERPLAN

UNEC DESIGN
MASTERPLAN
Highway underneath UN plot (safety?)
MASTERPLAN
PLAN NY 2020

VISION PLAN EAST RIVER WATERFRONT
MANHATTAN, NEW YORK CITY

Main aspects:
- Every New Yorker has to be able to go to a park within 10 minutes from home or work
- Connecting existing park structures
- Bicycle roads all around Manhattan
- Increasing facilities and recreational areas
MASTERPLAN
PLAN NY 2020, The missing link
MASTERPLAN

PLAN NY 2020, The missing link
In order to get better grip on the specific connections between water and city tissue, a series of sections has been made, both for the area north and south of the UN plot. Main focus is the position and impact of the highway (Franklin D. Roosevelt East River Drive) along the riverbank.
MASTERPLAN
Shortcomings

security
connection city-water
traffic situation around UN plot
MASTERPLAN
Possible solutions

OPTION 1: KEEP CURRENT SITUATION

OPTION 2: EAST RIVER DRIVE DELETED

OPTION 3: TUNNEL UNDER 2ND AVENUE

OPTION 4: TUNNEL UNDER EAST RIVER
MASTERPLAN
Tunnel solution

TUNNEL SECTION

MASTERPLAN
Connecting the parks
**MASTERPLAN**

Visionplan

- Subway station
- Waterbus
- Bike lane
- Restaurants & Bars
- Sport Facilities
MASTERPLAN
Visionplan
MASTEBPLAN
Impression

- stormwater storage
- UV filtering in wetlands
- extra UV treatment
- ponds with helophytes

Source: Sherbourne Common
Waterfront Toronto
MASTERPLAN
Situation around UN plot
MASTERPLAN
Final design
MASTERPLAN
Impression
MASTERPLAN
Impression
WHAT / WHY / WHERE

MASTERPLAN

UNEC DESIGN
UNECE
Masterplan, influence in program and design
UNEC
Masterplan, influence in program and design
Masterplan, influence in program and design
UNEC
Masterplan, influence in program and design
UNEC

Masterplan, UN design sketch (1945)
# UNEC

**PVE, Conference / Lobby**

<table>
<thead>
<tr>
<th>ENTRANCE</th>
<th>COLLECT</th>
<th>PRODUCE</th>
<th>PROPAGATE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>930 m²</td>
<td>1835 m²</td>
<td>1224 m²</td>
<td>3536 m²</td>
<td>3330 m²</td>
<td>2680 m²</td>
<td>2300 m²</td>
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<tr>
<td>6%</td>
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<td>17%</td>
<td>14%</td>
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## UNEC

**PVE, Entrance / Info desk / Safety**

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<td>135 M²</td>
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<td>353 M²</td>
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<td>268 M²</td>
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# UNEC

PVE, Library / Readingroom (public interaction)

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[Diagram of UNEC PVE, Library / Readingroom showing ENTRANCE, COLLECT, PRODUCE, PROPAGATE, EXCHANGE, GENERAL, FACILITIES areas]
**UNECS**

PVE, Auditorium / Productspace / Expo / Press

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UNEC
PVE, Offices / Meeting / Brainstorm / Facilities

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</table>

[Diagram of UNEC PVE, Offices, Meeting, Brainstorm, and Facilities with various spaces and departments labeled.]
UNECA
Programmatic concept

TO EMBRACE
UNEC
Programatic concept, abstract
UNEC
Programatic concept, abstract
UNEC

Programatic concept, city to park
Development of form

*creating volume*
Development of form

creating volume

conference pressed downwards
retrieving space and light
UNECC
Development of form

creating volume

conference pressed downwards
retrieving space and light

restoring physical relations by
introducing a cut
**UNEC**

Development of form, position of the eye

- *functions in space*
- *center position*
- *radial grid*
**UNEC**

Development of form, position of the eye

*functions in space*  
*off-center position*  
*radial grid*
UNECS
Building design
UNECE

Situation 1:1000
UNECKi
Impression, city entrance
UNEC

Impression, park entrance
UNECE
Plans Entrance area (TV)
UNEC

Plans Entrance area (TV)
**UNEC**

Impression, Entrance hall
UNEC
Plans, Parklevel (-1)
UNEC
Plans, Parklevel (-1)
UNEC
Plans, Parklevel (-1)
UNEC
Plans, Parklevel (-1)
UNECC
Plans, Parklevel (-1)
UNEC
Impression, Lobby
UNEC
Impression, Conference hall
UNEC
Plans, BG + 1th (office)
UNECC
Plans, BG + 1th (meeting/brainstorm/video)
UNEC
Plans, 2th (canteen / restaurant)
**UNEC**

Facade concept (radial potential)

**NORTH / CLOSED**

**SOUTH / OPEN**
**UNEC**

Facade concept (a smooth glass disk with vertical shutters)
UNECE
Facade concept (climate adaption)

SUMMER
DAY

WINTER
NIGHT
UNEC
Facade build-up, glass facade
UNECC
Facade build-up, horizontal lining (glass with white backface)
UNEC
Facade build-up, introducing extra lines (merging)
UNEC
Facade build-up, wooden window frames (with hatch)
UNECE
Facade build-up, climatic consequence

\[
ZTA = \text{Solar gain (heat)}
\]

\[
\text{average } 0,6-0,7 \rightarrow 0,3
\]

\[
LTA = \text{light transmittance} \rightarrow \text{decreasing}
\]

Summer
UNEC
Facade build-up, climatic consequence

\[ ZTA = \text{Solar gain (heat)} \]
\[ \text{(average 0,6-0,7) -> 0,3} \]

\[ LTA = \text{light transmittance -> decreasing!!} \]
**UNEC**
Facade build-up, climatic architectural solution (shutters)

---

**ZTA** = Solar gain (heat)  
(average 0.6-0.7) -> 0.7

**LTA** = light transmittance -> increasing!!  

---

**Summer**  

**Winter**
**UNEC**
Facade build-up, shutter size

extreme situation without shutter
20% coverage

extreme situation with shutter
60% coverage will work

common situation
up to 80% or more

Shutter size will varie from ~ 1400 - 900 mm from south to north
UNECE

Elevation, waterfront
UNEC
Climate, Energyroof
UNECE
Climate, Energyroof + PV Foil
**UNEC**
Climate, Energyroof + PV Foil

**Roof specifications per year**

<table>
<thead>
<tr>
<th>Material</th>
<th>Area</th>
<th>Energy (hot)</th>
<th>Energy (cold)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energyroof</td>
<td>3740 m²</td>
<td>1507 MWh</td>
<td>301 MWh</td>
</tr>
<tr>
<td>PV-Foil</td>
<td>3120 m²</td>
<td>196 MWh</td>
<td></td>
</tr>
</tbody>
</table>

*Divided in two separate tanks of ~150,000l each.*
UNEC
Climate, Concrete core activation + natural ventilation (offices)
UNEC
Climate, natural ventilation to the test (5 degrees outside temperature)

UNEC
Climate, natural ventilation and dual coil air system (central zone)
UNECE
Climate, natural ventilation and dual coil air system (-1)
Climate, thermal mass / night flush
Reflective walls and ceiling in combination with the warm appearance of wood (PLATO)

project: Marine Institute, Galway, Ireland
UNEC
Facade, section 1:50
UNEC
Facade, section 1:50
- water barrier (bitumen)
- isolation 200mm
- 18mm plywood
- isolation layer
- white foil
- double glazing ZTA (0.7)
- bubbledeck 480
- water barrier (bitumen)
- isolation layer 200mm + system layer with collector plates and pipes
- PV foil elements
- steel bracket 4mm
- vent module (automated)
- double glazing 20mm (ZTA 0.7)
- rubber seal
- steel hinge
- wood laminated shutter 80mm
- polished concrete surface
- finishing layer concrete 50mm
- bubbledeck 480 (concrete core)
- ventilation module (automated)
- white film
- double glazing 20mm (ZTA 0.7)
- rubber seal
- steel hinge
- wood laminated shutter 80mm
- polished concrete surface
- finishing layer concrete 50mm
- bubbledeck 480 (concrete core)
- ventilation module (automated)
UNEC
Construction, load bearing structure

\[ \text{Vbhnwlrk} = \frac{1}{15 \cdot l} \]
\[ \text{max } l = 18000 \text{ mm} \]
\[ \text{i.v. punct last } = 2600 \text{ mm} \]
ANY QUESTIONS?
### Comparison energy consumption

<table>
<thead>
<tr>
<th>Energy Consumption</th>
<th>Total Standard UNEC Building</th>
<th>Total UNEC Building using Environmental Percentage Energy Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MWh</td>
<td>MWh</td>
</tr>
<tr>
<td>Space Heating</td>
<td>966,75</td>
<td>380,77</td>
</tr>
<tr>
<td>Cooling</td>
<td>791,65</td>
<td>362,63</td>
</tr>
<tr>
<td>Ventilation</td>
<td>335,28</td>
<td>123,93</td>
</tr>
<tr>
<td>Water Heating</td>
<td>76,55</td>
<td>30,62</td>
</tr>
<tr>
<td>Lighting</td>
<td>525,36</td>
<td>129,23</td>
</tr>
<tr>
<td>Interior equipment</td>
<td>1644,93</td>
<td>1644,93</td>
</tr>
<tr>
<td>Total</td>
<td>4340,52</td>
<td>2672,11</td>
</tr>
<tr>
<td>Total excluding interior equipment</td>
<td>2695,59</td>
<td>1027,17</td>
</tr>
</tbody>
</table>

**Source:** Leonie Welling

### Roof specifications per year

**Energyroof**

- **PV-Foil**
  - 3740 m²
  - 1507 MWh (hot)
  - 301 MWh (cold)

- **3120 m²**
  - 196 MWh
Energiedak®
Koning Willem I college, Den Bosch

- 15 gebouwen, 33.000 m² bov
- Centraal ketelhuis met warmte-distributienet
- Twee buffertanks van elk 110 m³
- Capaciteit hybride warmtepomp 800 kW
- Oppervlak Energiedak® (thermisch) 936 m²
- Opgewekt vermogen Energiedak® 1.357 GJ
- Jaarlijkse besparing op aardgasverbruik 470.000 m³ (was 780.000 m³)
- Jaarlijkse besparing netto € 188.000
Energiedak®
Christiaan Huygens College, Eindhoven

- Beschikbaar dakoppervlak 2228 m²
- Aantal m² Energiedak® (thermisch) 1123 m²
- Aantal m² PV 850 m²
- Opgewekt vermogen thermisch 1.628 GJ
- Opgewekt vermogen PV met 394 modules / totaal 56.736 Wp
- Capaciteit bronnen 2 doubletten van elk 65 m³/h
- Capaciteit warmtepomp(en) 850 kW
- Jaarlijkse besparing € 37.000