A Tangible Lightness
An Architecture For The United Nations Environmental Council Headquarters, NYC
P5 | 2012-06-26 | Martin Lariviere 4117514
Natria
The United Nations Environmental Council Headquarters, NYC

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Conclusion | Sensing Natria
Introduction | SADD & U.N.E.C.

a | Sustainability
b | Strategic Architectural Design Development
c | The United Nations
d | New York City
Sustainability

“meeting the needs of the present without compromising the ability of future generations to meet their own needs”

-Brundtland Commission (UN, 1987)
Good Architecture is Sustainable.
Strategic Architectural Design Development: A Search For a Timeless Sustainable Architecture
A New Headquarters for the United Nations Environmental Council
New York City: A dense metropolis looking forward to a greener future
The United Nations, NYC
i. Masterplan  |  Reclaiming The Waterfront

a  |  Midtown East Manhattan: The Existing Situation
b  |  Public Spaces - Square & Parks
c  |  A New Waterfront
d  |  The United Nations Plot
e  |  Urban Integration
A few quality public green spaces within walking distance
The FDR Drive: Isolating the East River Waterfront
Arresting

Restful
Waterfront Development

UNEC

Waterfront Promenade

East River

OPTION 4

i. Masterplan | Reclaiming The Waterfront
Site Plan - The New Waterfront Promenade

UNEC

East River

UNEC
Connected Waterfront
Healing Gardens - 8 Basic Characteristics

1. Serene

2. Wild

3. Rich in Species

4. Space

5. The Common

6. The Pleasure Garden

7. Festive

8. Culture

ii. Site

Presence & Public Event

a. Site Zoning and Routing
b. Site Security Strategy
c. Embracing the Existing Site - Character and Existing Buildings
d. Dissolving Boundaries From Waterfront to UN Buildings
e. Siting a New Building
Sun Study Time Lapse:
Spring/Fall Equinox 0700h-1700h
Expanding Sky Towards The East River

Key Observations:
- Heights diminish towards the UN
- Amount of greenery increases
- Bridge at the mouth of E 42nd S
Entry Into The UN Square: Becoming One With The Sky
iii. Building I A Tangible Lightness

a I Siting A New Volume
b I Defining Site Values
c I Exploring Massing and Typology
d I Reacting to Built Context
Massing & Sustainability Strategy

- **Compact Mass**
- **Formal Square Orientation With Facade Refinement**
- **Atria Admit Daylight**
- **Site Volume to North to Receive Max. Amount of Daylight**
- **Use of Overhang to Shade South Facade in Summer**
- **Potential to Use Atria in Climatic Design**
iii. Building | A Tangible Lightness
iv. Program | Amongst Public & Private

a | Working Towards Sustainability
b | Program Organization
c | Program - From Office to Auditorium
d | Structural Strategy
iv. Program | Amongst Public & Private

- General Office: 2680m²
- Collect: 1835m²
- Produce: 1240m²
- Facilities: 1895m²
- Exchange: 3330m²
- Propagate: 3150m²
- Entrance: 930m²
iv. Program | Amongst Public & Private
iv. Program | Amongst Public & Private
PLAN LEVEL 2  (+8.000)

4269.5m² GFA
3056.6m² NFA
Net : Gross = 71.59%
iv. Program | Amongst Public & Private
Facade Symbolism & Technique

a. The Building & The Square
b. A Symbol For Sustainability
c. Technique
d. Refining The Elements
e. Play With Light
A MOMENT OF WONDER,
THE LINGERING GLANCE CAPTURES
THE SENSES AND MIND.
Developing a Sustainable Facade: Some Important Considerations

Shading: Cooling load is one of the main issues for office buildings.

Thermal Insulation: Highly glazed buildings have larger potential for thermal issues.

View: Pleasurable, calming, provides distance relief for the eyes.

Prefabration: Reduce on-site construction=cost savings. Factory production is more efficient with less waste.
Defining Starting Points

Intersection of partitions and floors with facade

Openings offset 500mm from partitions at exterior & large areas divided—windows raised 750mm from 1/0 floor

Main corridor locations—potential for visual connection to exterior and/or potential location for balconies

Impact zones of main entry, secondary entry & cafe/bar space on facade
Divergence: Exploring Options

Option A - Colonnade

- Functions: Colonnade
- Scale: 1/500

Option B - Frame

- Functions: Framing
- Scale: 1/500

Option C - Planar

- Functions: Planar
- Scale: 1/500

Option D - Closed Volume

- Functions: Closed Volume
- Scale: 1/500
Convergence: Developing a Vision

Option A - Colonnade

FUNCTIONS OF COLONNADE:
- Order, facade
- Blue line of built/existing, while maintaining simple facade
- Support floor elbows/facades
- Scatter light (act as vertical, louvres)
Facade Zones

Upper Zone
Middle Zone
Lower Zone

Main Axes
Entry Axis
Middle Atrium Axis
River Atrium

Vertical Division w/ Atria Beyond
(Based on Structural Grids)

Facade Development

Scale 1
Scale 2
Scale 3
Scale 4

Scales
Scales
Refining & Testing Technique

- 100% open facade:
  - Clay, heat gain
  - Full view (glass does not interpenetrate)

- Punch openings
  - Translucent
  - Less view, daylight maximizes climate

- Rectangular openings
  - Better shading
  - Less view

- Divided openings
  - More opening, main view
  - Expression or plunge?

- Incidence depth
  - View, program at lower levels
  - ?
Facade Study - Options and Variables

Facade A
- 30cm wall thickness

Facade C
- 50cm wall thickness
- 25cm overhang
- Horizontal louvre & light shelf (interior)

Facade C
- 50cm wall thickness
- 25cm overhang
- Horizontal louvre & light shelf (interior)
- Colonnade 150cm offset from facade
- Extended horizontal louvre

1500 h
End May
End August

1500 h
End May
End August

1500 h
End May
End August
Facade Animation
Spring/Fall Equinox, 0800h-1800h
Summer Sun

1000h

1200h

1400h

1600h

1800h

Winter Sun

800h

1000h

1200h

1400h

1600h
Bethel White Granite:
A Durable Local Stone

Fine bush-hammered

For this finish, the spacing of the teeth on the (interchangeable) hammerhead should be 4–5 mm (corresponding to 12 x 12 teeth). This produces a flat, regular, plain surface.
Lightweight Stone Veneer
SEMI-RIGID MINERAL FIBRE BD. INSULATION, FURRING CHANNELS AND CONTINUOUS INTERLOCKING ANCHORS
Facade Construction Sequence
VERTICAL SECTION DETAIL
SOUTH FACADE
SCALE 1:5

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iv. Program | Amongst Public & Private
Why not inscribe the colonnade with something personal, something of the world, of the earth and its people, and of nature.
Scales of Entry

Scaling stages of a building can create an intimate, personal, experience.

Key Observations:
- Funnelling or turning before entry leads to awareness of surroundings and classification of a private entry.
- Changing perspective creates a personal experience.
- Scale staged from Grand public scale to intimate personal scale.

River

City
iii. Building | A Tangible Lightness
v. Atria

1 Places of Wonder

a | Concept
b | Development
c | Climatic Design
d | Ordering Space
e | Moments of Rest
Why Atria?

Four Functions:
- Cultural - welcoming, people and people watching central
- Economic - can be built and run for less, daylighting simpler, heat loss and gain reduced, solar energy can be harnessed.
- Shelter - interaction between court and space is where subtle sheltering occurs, giant double glazing form, buffer space
- Accommodation - Centralized atria rooms = sense of unity
ELEMTS: WALLS, COLUMNS, SKYLIGHTS, MONTER LIGHT BALCONIES.

CONSTRUCTION CONCEALED

- ABOUT THE SPACE,
  MASSIVE EXPRESSION OF ELEMENTS VS. PILORE.

CONSTRUCTION.
Flowing Pools: Local Evaporative Cooling Effect

Peak Sun June 21st 1200h
Winter Sun Dec 21st 1200h

Radiant Floor Heating
Chilled Ceilings

Stack Effect Aids Exhaust of Used Air in Skylight

Large Frame Accomodates Climate Installations

Conditioned Atrium Space

Supply Air
Return Air

Cool Air Mass in Auditoriums

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Supply Air Return Air

Shaded Facade With Light Shelves

Conditioned Atrium Space
Structure & Program

iv. Program | Amongst Public & Private
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The use of mirrors to dissolve walls and extend space.
. Conclusion | Sensing Natria

a  | Sustainability - Summary
b  | Serial Vision - Experiencing the Spaces
c  | Reflections From Process to Product
d  | Recognition & Growth
e  | Projections
A Summary of Sustainable Principles

   - Compact Building
   - Natural Daylighting (Light shelves, atria)
   - Facade Shading Strategies (Solar gain in winter, blocked in Summer)
   - Lowered amount of glazing in comparison with other office buildings
   - Atria shading (admit North light, filter unwanted solar heat gain from South)
   - Durable Materials, Natural wherever possible.
   - Healing Gardens and Green Space

   - Greywater systems
   - Heat exchange with East River for systems cooling
   - Geothermal heat pumps in combination with radiant floors and chilled ceilings
   - Rainwater collection & storm water retention (flowing ponds & green roof)
   - Stack effect ventilation from atria (mechanically assisted as required)
   - ................