RETHINKING SUSTAINABILITY
UN ENVIRONMENTAL COUNCIL, NYC

ERIC CAMERON STOCKAND [4123883] MATERIALISATION & DESIGN DEVELOPMENT [TUDELFT] SADD P4 [25.10.12]
INTRODUCTION

SUSTAINABILITY?

THE UNITED NATIONS

MANHATTAN
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Brundtland Commission, United Nations 1987
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<tr>
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193 Member Countries
CONTEXT | NEW YORK

AREA
1.213 KM²

POPULATION
8.2 MILLION

DENSITY
10,500/KM²
CONTEXT | NEW YORK
1600 - 2050

1609 • 2009 • 2050
CONTEXT | NEW YORK
REGIONAL ISSUES

POLLUTION

GREEN SPACE

URBAN FARMING + FOOD PRODUCTION
New York City Watershed System

- **Croton System, 1842–1917**
  - Contains 12 reservoirs, three controlled lakes, the Croton Aqueduct, and the Jerome and Central Park Reservoirs
  - Provides 10% of the city's water supply
  - Supplies 180 million gallons per day

- **Catskill System, 1905–1928**
  - Consists of Ashokan and Schoharie Reservoirs, the Shandaken Tunnel, the Catskill Aqueduct, and the Kensico and Hillview Reservoirs
  - Provides 40% of the city's water supply
  - Supplies 600 million gallons per day

- **Delaware System, 1940–1964**
  - Consists of Cannonsville, Pepacton, Neversink, and Rondout Reservoirs, and the Delaware Aqueduct
  - Provides 50% of the city's water supply
  - Supplies 890 million gallons per day

- **In-city Distribution System, 1917–today**
  - Consists of three water tunnels and water main network

Source: NYC Dept. of Environmental Protection
GREEN SPACE

AN OPPORTUNITY

CONTEXT | GREEN SPACE

 CENTRAL PARK

ST. CATHARINE'S PARK

BRYANT PARK

ST. VARTAN'S PARK

MADISON SQUARE PARK

BELLEVUE SOUTH PARK

1000m radius [10 min] 500m radius [5 min]
CONTEXT | SITE

INITIAL IMPRESSIONS
New public spaces/routes
New public traffic
New masterplan, Scale 1:2500

BEFORE
AFTER

SaDD
Angelo Picocrie, Dennis Roest, Feike Laane, Hao Wang, Mirko Evers, Walter Brouwer & Yu Tian

MASTERPLAN | NEW
SITE PLAN
MASTERPLAN | NEW
SECtIONS

New public spaces/routes
New public traffic
New masterplan, Scale 1:2500
Public Space Diagram
BEFORE
AFTER
Traffic Flow Diagram
AFTER
BEFORE

SaDD
Angelo Picocrie, Dennis Roest, Feike Laane, Hao Wang, Mirko Evers, Walter Brouwer & Yu Tian
DESIGN GOALS
LOCAL GUIDELINES

HIGH PERFORMANCE LANDSCAPE GUIDELINES
21ST CENTURY PARKS FOR NYC
A PROJECT OF THE DESIGN TRUST FOR PUBLIC SPACE
AND THE NEW YORK CITY DEPARTMENT OF PARKS & RECREATION

1. DESIGN
   • ENGAGE ALL USERS
   • ENGAGE NATURE
   • RESPOND TO SITE CONTEXT

2. ECOLOGY
   • SUPPORT ECOLOGICAL FUNCTION
   • INCREASE DIVERSITY AND INTERCONNECTIVITY

3. ECONOMY
   • RESILIENCY
   • PERFORMANCE

4. SOCIETY
   • COLLABORATION + PARTICIPATION
   • PUBLIC HEALTH
   • EDUCATION
   • LONG-TERM THINKING
DESIGN DEVELOPMENT | MASSING
PRELIMINARY CONCEPT
DESIGN DEVELOPMENT | SITE PLAN

LANDSCAPE ELEMENTS

SITE PLAN 1:2000
DESIGN | GOALS

LOCAL GUIDELINES

- WATER RETENTION/COLLECTION POND FOR SITE + BUILDING RUN OFF
- PARTIALLY FILTERED RUN OFF USED FOR ORCHARD IRRIGATION
- TERRACED FILTRATION WATERSCAPE
- FULLY FILTERED WATER STORED AND CIRCULATED FOR BUILDING USE
DESIGN | PROGRAM + REQUIREMENTS
AGENTS + STAKEHOLDERS
DESIGN | FACADE DEVELOPMENT
CONTEXT SENSITIVE

VIEWS
EAST RIVER
CITY
UN HEADQUARTERS

OPACITY

ELEMENTS

FAÇADE OPTIMIZATION
NORTH
EAST
WEST
SOUTH
MASSING OF THE BUILDING IS SKEWED BASED ON ORIENTATION TO MAXIMIZE SHADING ON SOUTH AND WEST SIDES
DESIGN | ORGANIZATION
MAIN CIRCULATION ROUTES

STAFFROUTE
PUBLICROUTE
DELEGATEROUTE
DESIGN | ORGANIZATION
FLOOR AREA + PROGRAM: FLOOR 1

CORES: 531.9 m²
ROOMS: 1407.2 m²
CIRC/OTHER: 5177.8 m²

TOTAL: 7116 M²

+ 246.9 m² OUTDOOR SPACE
DESIGN ORGANIZATION

FLOOR AREA + PROGRAM: FLOOR 2

CORES: 531.9 m²
ROOMS: 1399.3 m²
CIRC/OTHER: 3708.9 m²

TOTAL: 5640 m²

OFFICE/ADMIN
COMMERCIAL/PUBLIC
PRESS ROOM
AUDITORIUM
STORAGE/AUXILIARY
VERTICAL CIRCULATION/SERVICES
OUTDOOR SPACES
GENERAL CIRCULATION

+ 759.3 m² OUTDOOR SPACE
DESIGN | ORGANIZATION

FLOOR AREA + PROGRAM: FLOOR 3

CORES: 531.9 m²
ROOMS: 1384.5 m²
CIRC/OTHER: 4106.7 m²

TOTAL: 6023 M²

+ 842.3 m²
OUTDOOR SPACE

OFFICE/ADMIN
COMMERCIAL/PUBLIC
MEETING ROOMS
KITCHEN
STORAGE/AUXILIARY
VERTICAL CIRCULATION/SERVICES
OUTDOOR SPACES
GENERAL CIRCULATION

33
FLOOR AREA + PROGRAM: FLOOR 4

CORES: 531.9 m²
ROOMS: 3011.4 m²
CIRC/OTHER: 2351.6 m²

+ 294.9 m²

TOTAL: 5895 m²

OFFICE/ADMIN
MEETING ROOMS
ARCHIVE
STORAGE/AUXILIARY
VERTICAL CIRCULATION/SERVICES
OUTDOOR SPACES
GENERAL CIRCULATION
DESIGN AXONOMETRIC PARK LEVEL
DESIGN | INTERIOR IMPRESSION
OFFICE SPACE
DESIGN | INTERIOR IMPRESSION
WEST ORIENTED OFFICE AREA
DESIGN | INTERIOR IMPRESSION

TERRACE OVERLOOKING PARK GREENERY
DESIGN | EXTERIOR IMPRESSION

VIEW FROM EAST RIVER
SPACE FRAME AS STRUCTURAL FACADE ELEMENT

STEEL STRUCTURE
ZONING OF FACADE FOR TRANSPARENCY BASED ON ORIENTATION
DENSITY OF OPENINGS RELATING TO ORIENTATION IS ILLUSTRATED IN COLOUR
DESIGN | FACADE DEVELOPMENT

FACADE IMPRESSION
PV PANEL
GLASS COVER
ANTI-REFLECTIVE SHEET
CELL
FRAME + PANEL BACKING
GREEN PANELS
**Geometrica Space Frame Canopies -- Details**

**Top Chord Hub Assembly**
- 3'-4" ø
- 3'-0" l
- 1/2" washers
- 5/8" A307 bolts
- Lock washer
- Full tap coupling nut
- Standoff (by Unisky) for 5/8" thread

**Bottom Chord Hub Assembly**
- 1 7/8" OD X 0.075" t.
- 8Zc hub 2 1/4" D X 3" L
- 2 X 3/8" washers
- 5/8" A307 bolt
- Lock washer
- 5/8" nut

**Typical Top Chord Hub Assembly**
- 4" ø
- 1 1/2" D X 3" L
- 2 X 3/8" washers
- 5/8" A307 bolt
- Lock washer
- Coupling nut for standoff

**Typical Bottom Chord Hub Assembly**
- 8Zc hub 2 1/4" D X 3" L
- 2 X 3/8" washers
- 5/8" A307 bolt
- Lock washer
- Coupling nut for standoff

**Detail Seat Fitting**
- Type 2 (4 required)
- 1/2"
- 1/4" E70
- 2'-8" clearances

**Web (typical)**
- 1 3/8" OD X 0.075 t.
- 1'-0" 1/32" PTFE sheet
DESIGN | TECHNOLOGY + CLIMATE

CLIMATE DIAGRAMS

ENERGY

GEO-EXCHANGE WELLS

HEAT EXCHANGERS CONNECTED TO EXISTING UN BUILDING
Daylight

PV Cells integrated into atrium and facade construction

Atrium allows maximum daylighting for interior spaces
RAINWATER COLLECTED FROM BUILDING AND STORED IN POOL

FILTERED GREY WATER STORED AND RETURNED TO BUILDING FOR USE
VENTILATION

THERMAL CHIMNEY AIDS NATURAL VENTILATION IN BUILDING

WATER FEATURE AIDS PASSIVE COOLING
IMPRESSIONS
PARK SPACE UNDERNEATH BUILDING
IMPRESSIONS
SOUTH FACADE AND ENTRANCE PLAZA
IMPRESSIONS

VIEW AT FIRST FLOOR NORTH-WEST CORNER OF BUILDING
IMPRESSIONS
VIEW AT SECOND FLOOR NORTH-WEST CORNER OF BUILDING
IMPRESSIONS

OFFICE SPACE ON THIRD FLOOR AT WEST SIDE OF BUILDING
IMPRESSIONS

AUDITORIUM WITH CAPACITY OF 650 PERSONS