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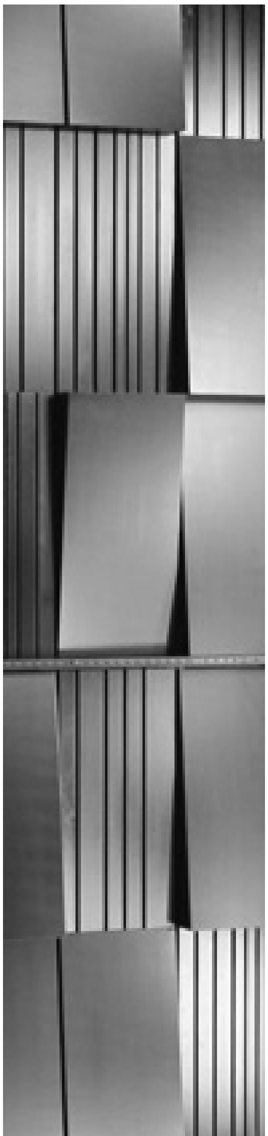
PRECEDENTS



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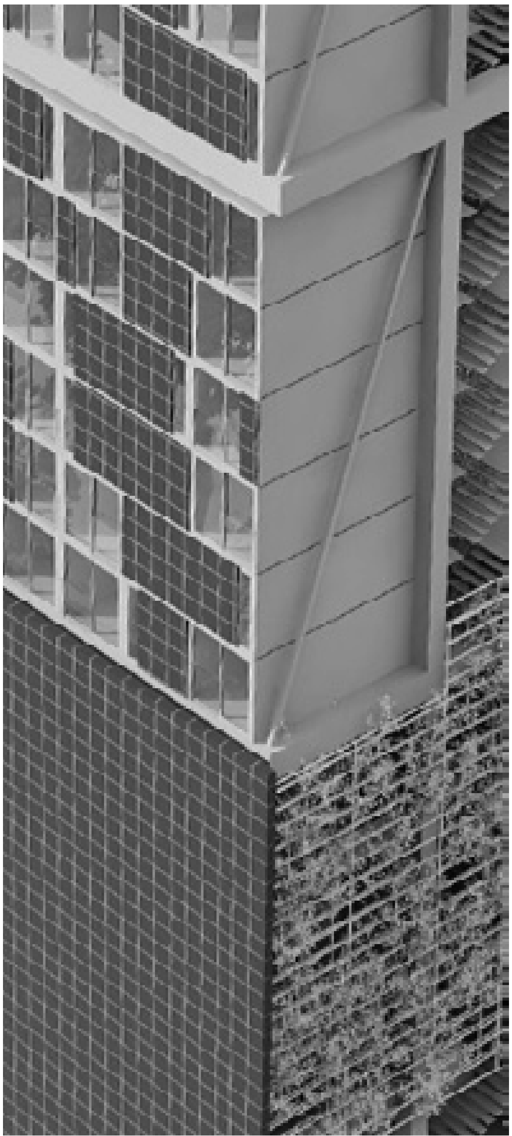


CHAPTER 6 PRECEDENTS

CASE STUDY

BUILDINGS THAT TEACH SUSTAINABILITY

GREENHOUSE PEOPLE'S ENVIRONMENTAL CENTRE

-Design:	James Jacobs & Nic Whitcutt (CBS Architects)
-Location:	Joubert Park, Johannesburg
-Client:	Greenhouse Project (NGO)
-Date:	2002 (Phase 1)
-Project Type:	Masterplan

BACKGROUND:

This project was an initiative by the South African NGO the Greenhouse Project (GHP) to address the needs of communities within Johannesburg to access resources and information, and explore more innovative ways of self-help.

The Greenhouse People's Environmental Centre (GHC) is situated in Johannesburg CBD's largest open space, Joubert Park. The centre hopes to empower the local communities to build and re-build their city in economically, socially and ecologically sustainable ways.

MASTERPLAN:

The masterplan for the GHC includes 7 phases that allow different parts of the northwestern corner of Joubert park to be developed still allowing for occupancy and use of the site by GHP throughout the process.

The first phase (to date the only phase completed) focused on establishing a administrative base for GHP by converting an old potting shed into a small office building. This phase also included developing the immediate surrounds, permaculture gardens and a willow wall. Phase 1 is a working example of a "green retrofit" to an existing building.

The upcoming phases will expanding the projects public service face by renovating the historic Victorian-style conservatory in Joubert Park and introducing a local recycling centre.

A working newly built double storey office will replace the potting shed as GHP office space illustrating innovative sustainable building techniques and materials. This in turn frees up the potting shed to become a resource and training centre.

Finally a triple storey office building is built to be rented out to the public. This phase will demonstrate high tech environmental solutions.

FOCUS AREAS:

- Educating local community through working demonstrations of sustainable ways to plan, build, landscape, manage energy, water and material resources.
- Distribution of Information that will help empower individuals in society to improve the quality of life in their community in a sustainable way.
- Supporting organisations that work to improve the urban environment. (focus on community based organisations)

Figure 69: The Greenhouse Project construction photos.

DESIGN APPLICATION

- The use of a working example to educate and uplift a community.
- The use of a working example to educate and uplift a community.

Figure 70: Conservatory today stands empty and neglected.

Figure 72: GHP Office building, old potting shed.

Figure 71: The Greenhouse Project: Site Plan

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PRECEDENT STUDIES

URBAN AGRICULTURE

LA TOUR VIVANTE ("THE LIVING TOWER")

-Design: Atelier SOA Architects
-Location: Rennes, France
-Client:
-Date:
-Project Type: Mixed-Use (Housing, Office, Agriculture)

Probably one of the most published vertical farming proposals to date, the Tour Vivante (Living Tower) project by SOA Architects integrates urban agriculture with housing and office space in a mixed-use high-rise building.

DESIGN APPLICATION

- The projects use of multiple programmes to activate the ground floor (street level) edges giving the building a public interface.

Figure 73: Perspective view of La Tour Vivante.

Figure 74: La Tour Vivante: Site Plan.

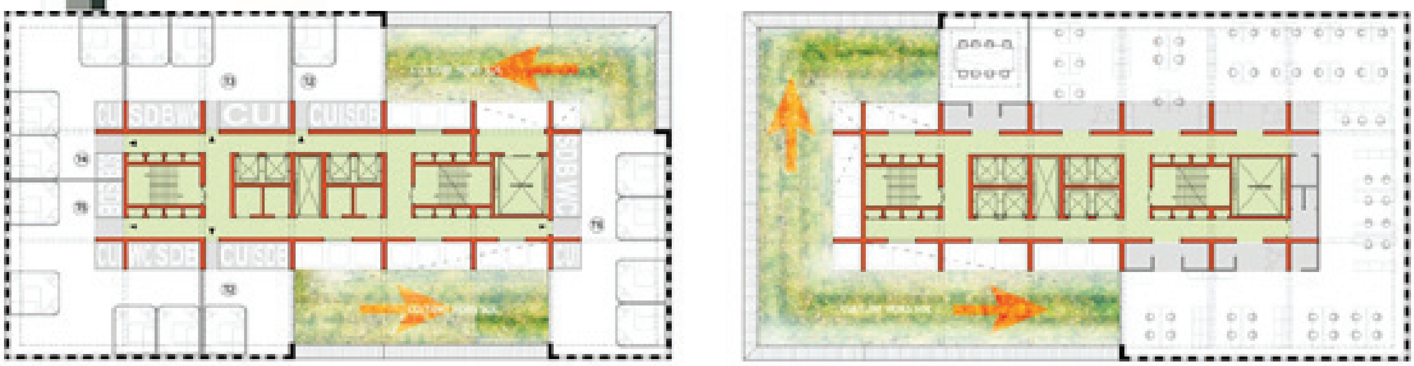

Figure 75: La Tour Vivante: Typical Plans.

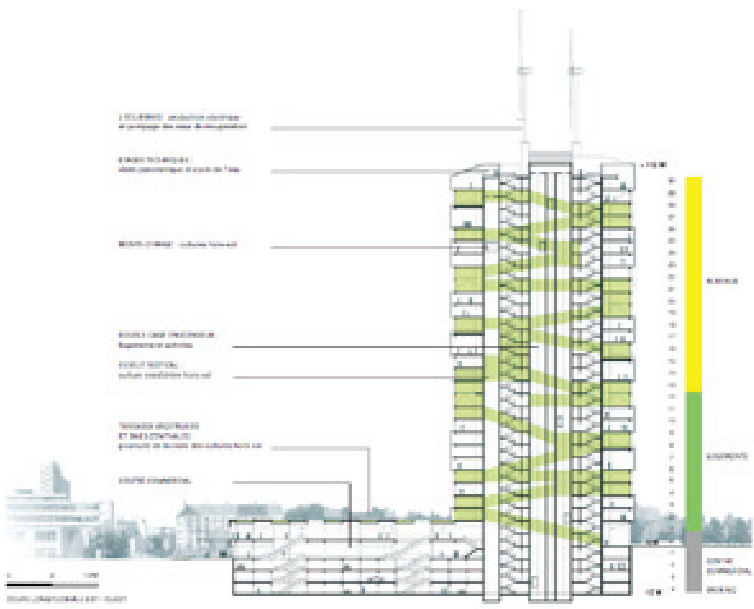

Figure 76: La Tour Vivante: Section showing mixed use.

Figure 77: La Tour Vivante: 3D section showing services.

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ECO_LABORATORY

-Design: Weber_Thompson Architects
-Location: Seattle, America
-Client: Living Building Challenge (Competition)
-Date: 2008 (Design Competition Entry)
-Project Type: Mixed-Use (Market, Residential, Education)

Recognizing a living building's dependence on multiple systems, Eco-laboratory is a synergy of economics, culture and environment. It is more than a building; its parts are inspired by a self sustaining, diverse ecological system.

Eco-laboratory merges a neighbourhood market, basic shelter, vocational training facility and public sustainability educational centre into a financially viable downtown residential development.

DESIGN APPLICATION

- The combination of sustainable building systems to create a balanced ecosystem within the building resulting in net-zero energy and water consumption.
- The successful integration of building systems with a living natural system.

Figure 78: Eco-Laboratory: Building perspective.

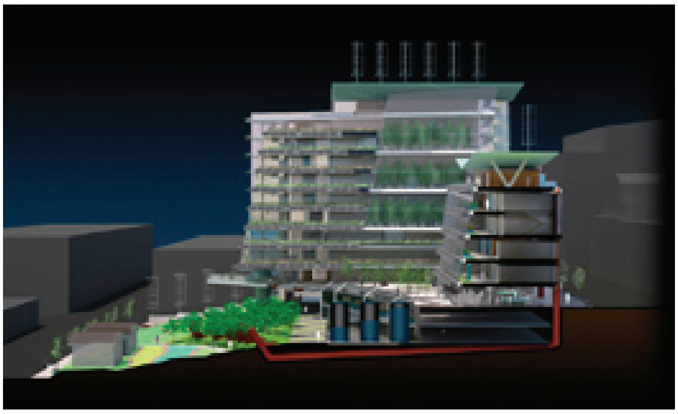


Figure 79: Eco-Laboratory: Connection to natural resources.

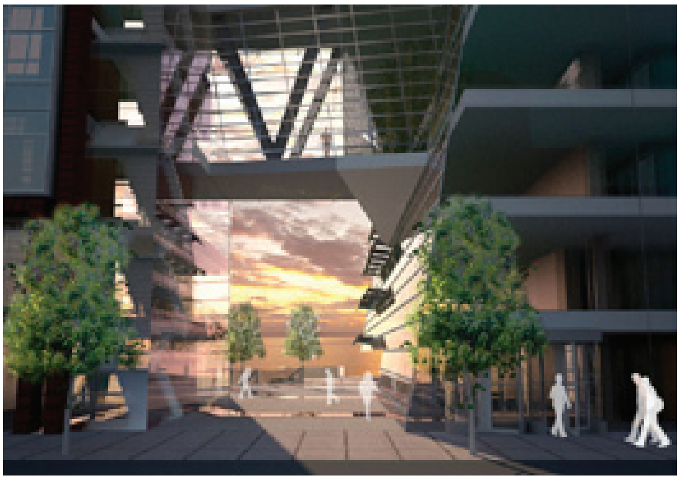


Figure 80: Eco-Laboratory: Courtyrad view.

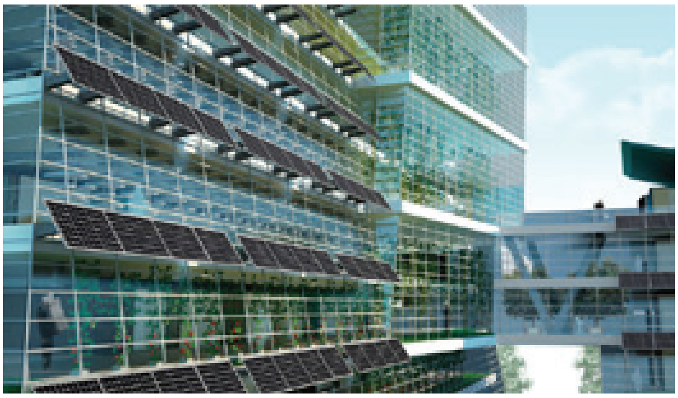
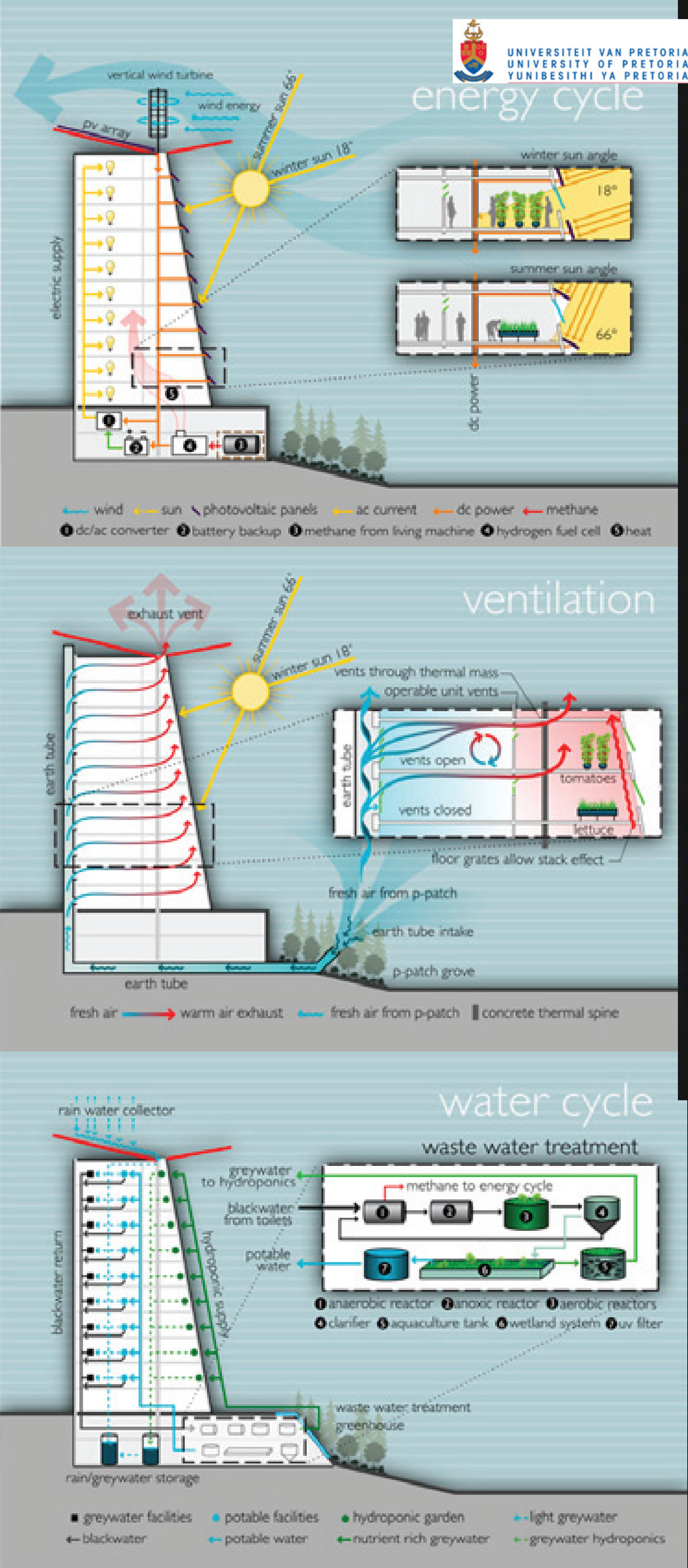


Figure 81: Eco-Laboratory: Facade study.



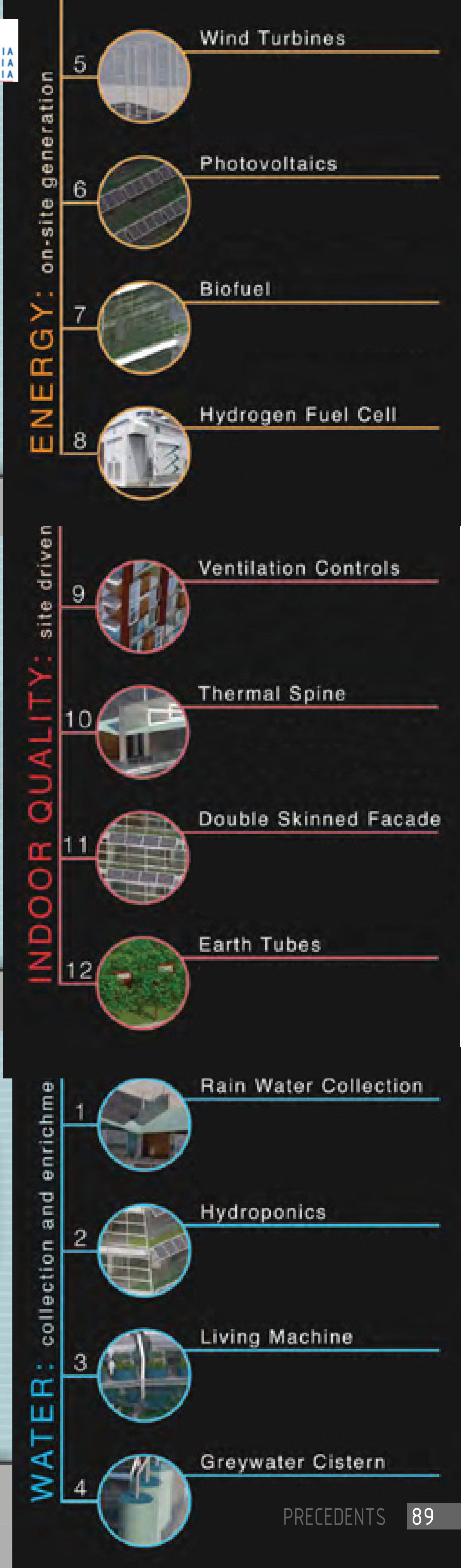


Figure 82: Eco-Laboratory: Building system diagrams.

CENTRE FOR URBAN AGRICULTURE

-Design: Mithun
-Location: Seattle, America
-Client: Non-Profit
-Date: Start 2007
-Project Type: Mixed-Use

The project is located on two triangular land parcels generated by the intersection of four roads.

Food, water, and energy are the focus of the "Centre for Urban Agriculture" (CUA) design. Agricultural features include fields for growing vegetables and grains, greenhouses, rooftop gardens, and even a chicken farm. Vertical construction allows for the CUA to incorporate more than an acre of native habitat and farmland on the building's .72 acre site.

With the goal of self-sufficiency, the CUA is designed to be completely independent of city water even providing its own drinking water. Grey water, as well as rain collected via the structure's 31,000+ sq. ft. rooftop rainwater collection area, would be treated and recycled on site. The filtering and purifying would occur through the use of greenhouses, planters, and biomembrane plants which utilize plants' ability to remove contaminates from water. 34,000+ sf of photovoltaic cells would collect energy, regulated over the seasons by storage as hydrogen gas in underground tanks.

DESIGN APPLICATION

- The use of under-utilized urban land for food production programme.
- Techniques for rainwater harvesting and re-use.

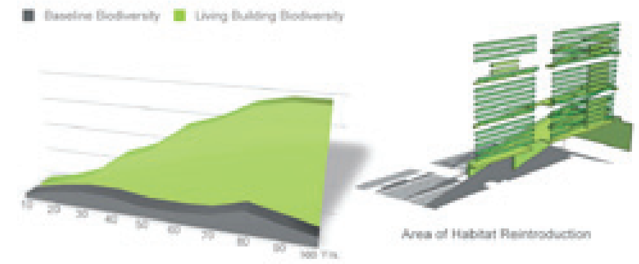


Figure 83: CUA: Habitat reintroduction area.

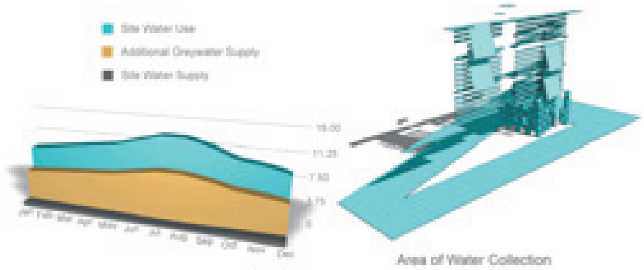


Figure 84: CUA: Water collection area.

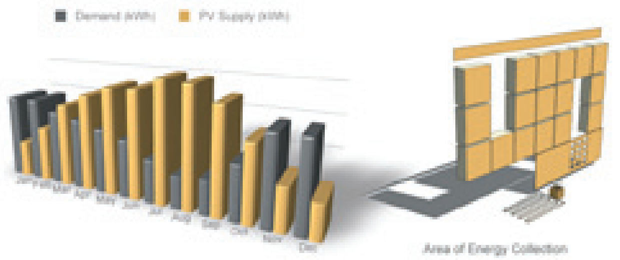


Figure 85: CUA: Energy collection area.

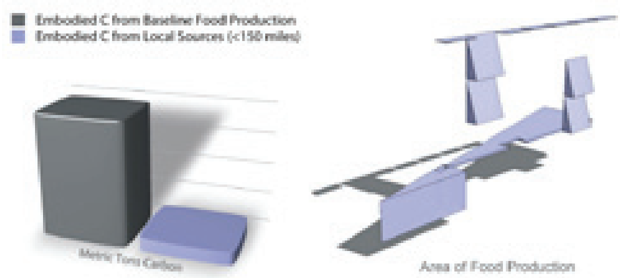


Figure 86: CUA: Food production area.

Figure 87: CUA: Building perspectives.

Figure 88: CUA: Building perspective showing use of under-utilized land.

BLENDING WITH CONTEXT

NEW OSLO OPERA HOUSE

-Design: Snohetta AS
-Location: Bjorvika, Oslo, Norway
-Client: Ministry of Church and Cultural Affairs
-Date: Completed 2007
-Project Type: Arts Complex

The Opera House is located on the Oslo Fjord, so close that it appears to rise out of the water itself and merge both land and water. The building has become the largest public venue to the arts and culture in Norway and thus representative of the political initiative growing in Oslo.

The building consists of 3 design elements, the wave wall, the factory, and the carpet.
The first design element critical to the design intent would be the wave wall. The location of the Opera House serves as a threshold between Norway and the rest of the world. The merging of water and land represents the integration of art into everyday life and everyday life into art.

Another aspect of the design includes incorporating the principle plan of a factory. Each section of the building is intended to promote and serve a separate function. In the end these separate sections merge with one another to serve a united purpose.

The
last

element is known as "the carpet." The concept of integration, togetherness, joint ownership and connection with all were included in the design details. Monumentally was achieved by focusing on horizontality of the design. The horizontal focus helped connect the Opera House to its surrounding area. Had the building been constructed more vertically, then it would no longer serve its unique purpose of acting as a threshold. The building would be so offset from the rest of the area that it would not blend with the rest of the city or enable art and civilization to interact on a higher level. The carpet defined the horizontality with a design to further enhance the buildings interaction with the previously mentioned principles of design.

DESIGN APPLICATION

- The use of a building as a threshold between nature and city..
- Manipulation of form to integrate architecture into a natural landscape.

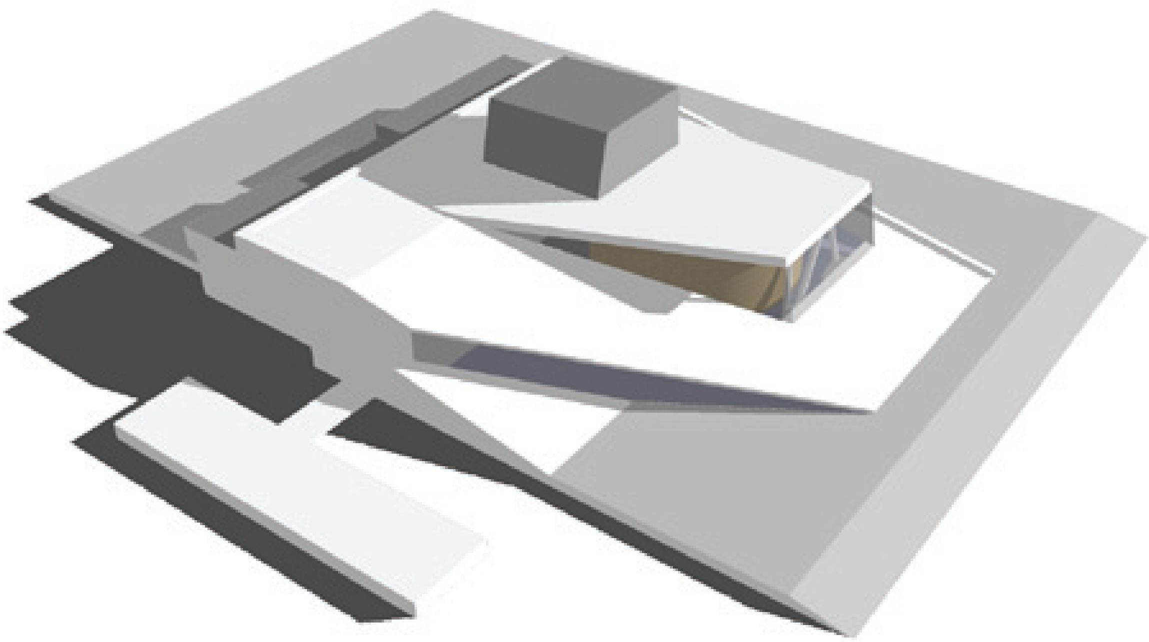


Figure 89: Oslo Opera House:Massing study.

Figure 90: Oslo Opera House:Building perspective from water.

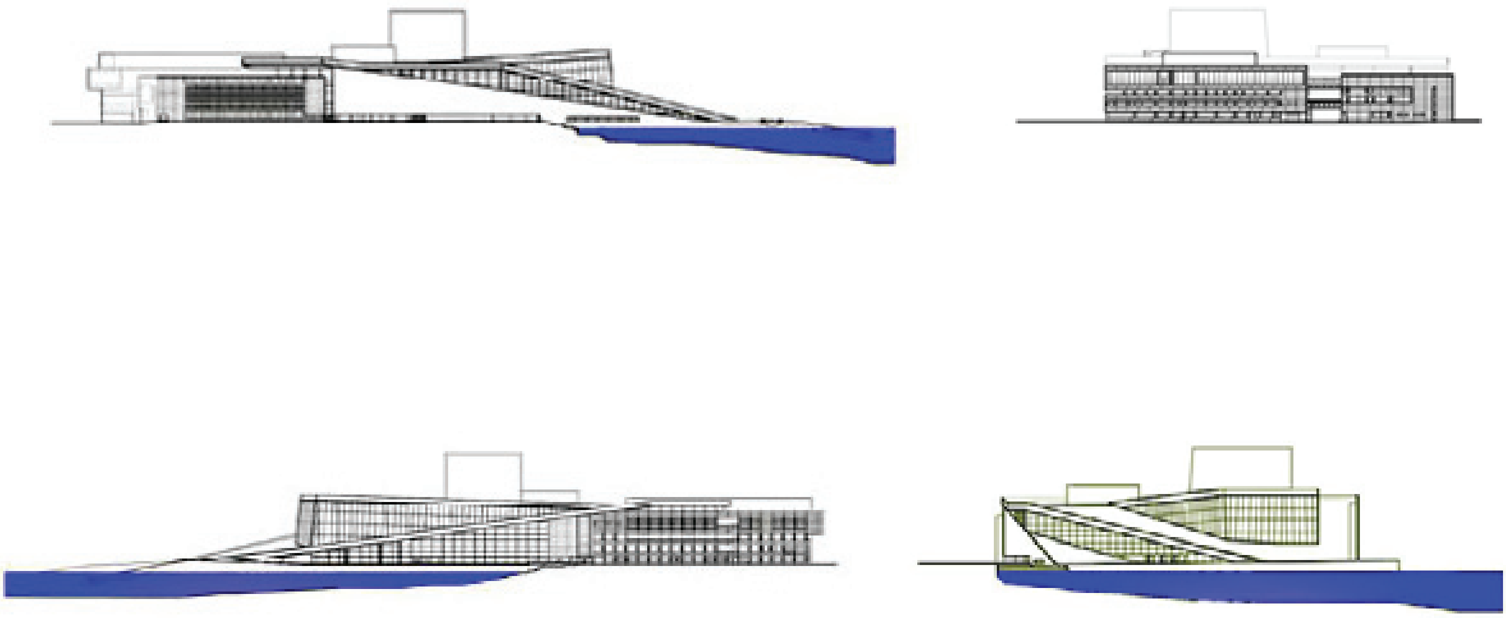


Figure 91: Oslo Opera House:Elevation views.

RESPONDING TO THE ENVIRONMENT

HONG KONG DESIGN CENTRE

-Design: FAR Frohn & Rojas
-Location: Hong Kong (Competition Entry)
-Date: 2006
-Project Type: Competition Entry

Being surrounded by an almost continuous three hundred foot wall of high-rise apartment buildings on three of four sides, the project acts as a grandstand, opening up the view towards the one unobstructed end: Junk Bay .

Cuts within the grandstand form light wells that provide ample and necessary daylight throughout all floors. While the wedge-like shape positions the project on an urban scale, it reflects at the same time an interior organization that aims to create a maximum of cross-synergies between the students of the different disciplines. All studio spaces are located on one stepped level at the top of the structure, while subject-specific shop and support spaces slip underneath this sloping studio floor with direct access to specific studio areas.

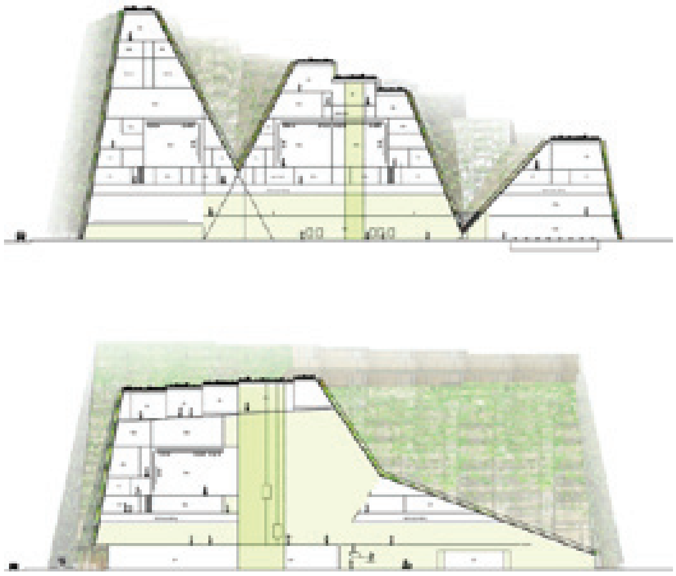


Figure 92: Hong Kong Design Centre: Sections.

DESIGN APPLICATION

- Building form responds to available views.
- Building form stepped to allow for maximum natural light.

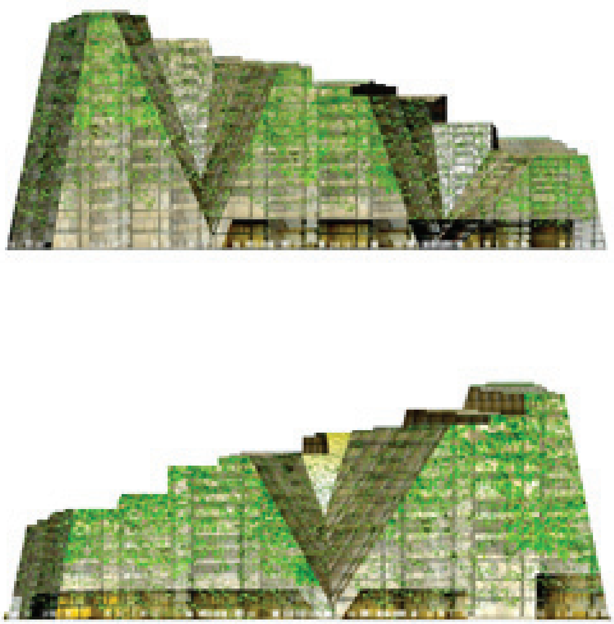
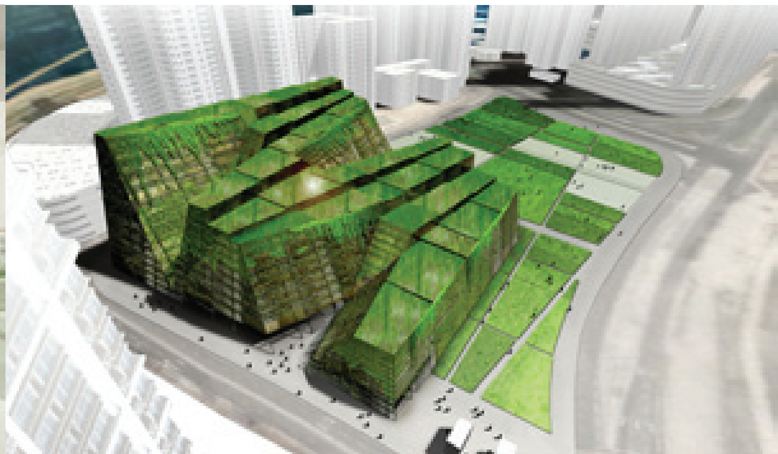


Figure 93: Hong Kong Design Centre: Elevations.

Figure 95: Hong Kong Design Centre: Concept models.

Figure 94: Hong Kong Design Centre: Perspectives showing building in urban landscape.



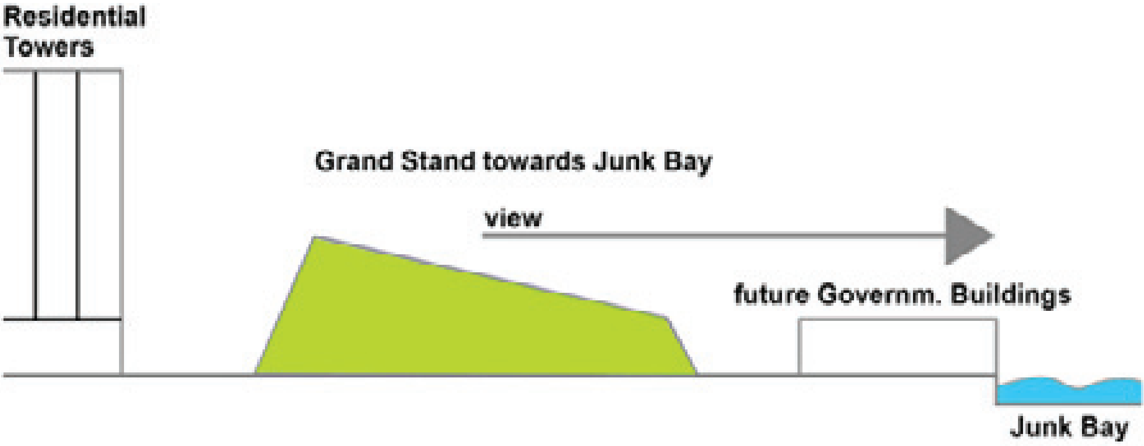


Figure 96: Hong Kong Design Centre: Building shape responds to view.

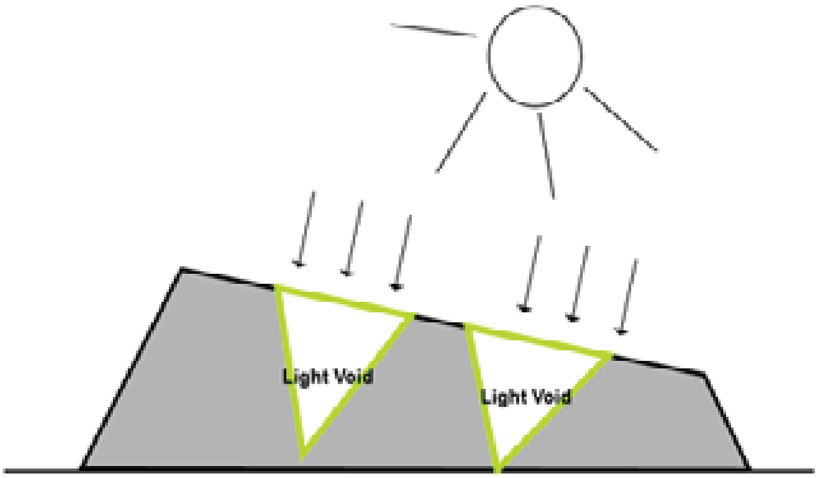


Figure 97: Hong Kong Design Centre: Building shape responds to daylight.

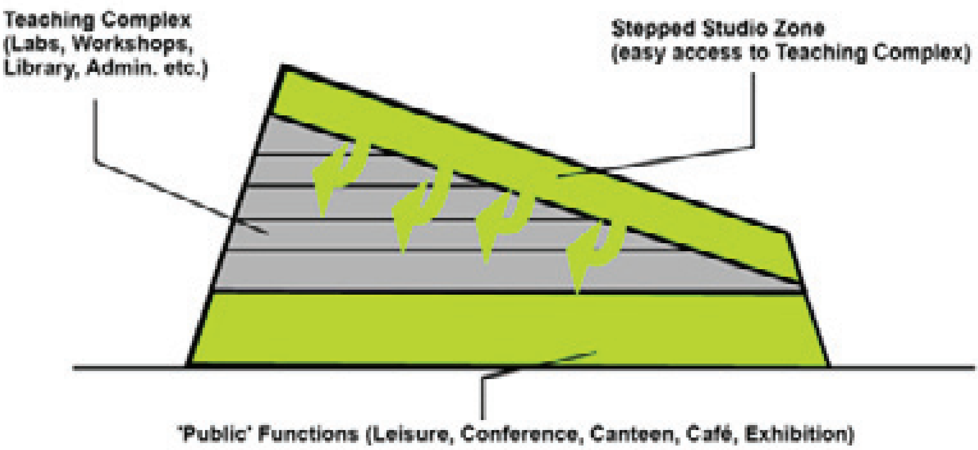


Figure 98: Hong Kong Design Centre: Building shape responds to program.