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## Pop-Up Cities

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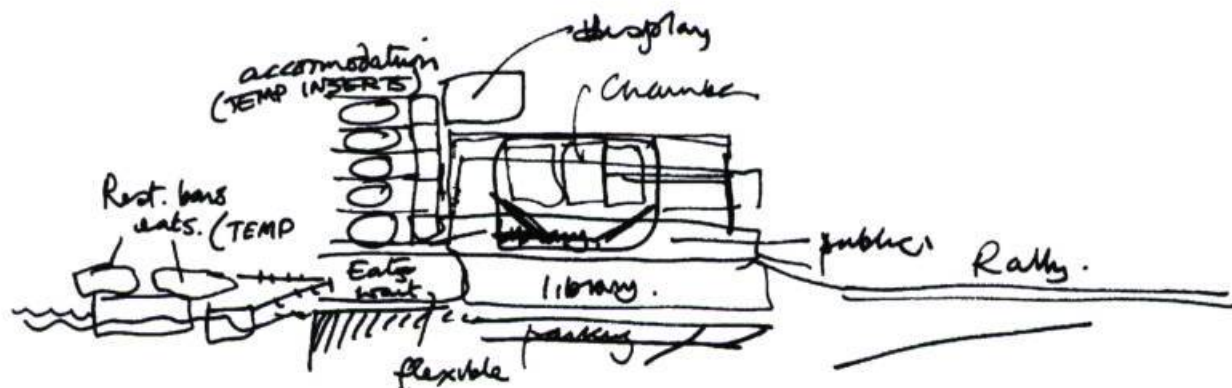
# FUTUR

## Pop-Up Cities

ities provoke endless speculation. They result from the cumulative, collective processes of daily life, complex, unpredictable, impossible to micro-manage. Conventional cities possess long time lines: enduring, accumulating, growing or depopulating over lengthy intervals. Then there is the short temporality of the wholly temporary city—any sort of seasonal, instant colony, highly structured in many ways, popping up in places to accommodate a circus, carnival or festival, or arising out of strife, emergencies or natural disaster, or simply occupying sites of ritual, religious or seasonal gatherings—from hunting camps to pilgrimage sites. Contemporary concern over changing environments—the realization that the planet's temperature, along with ocean levels, is steadily rising, or that oceans' gyres now have dead zones, has provoked intense interest in new solutions that involve ecological human settlements. Cities that are made up of movable, interchangeable components, cities that float upon or are anchored on water, cities that use zero energy or generate more energy than they consume, cities that incorporate agriculture so as to be self-sufficient in food production are some of the themes preoccupying contemporary designers.

understanding of specific phenomena of the natural environment in order to emulate natural principles as the foundation for sustainable building. Benyus uses the example of the pleated walls of a barrel cactus as an idea transferable to the form of a building envelope that can protect itself from desert heat. The need to found the design of cities on tested scientific principles is another index of that sense of urgency, the feeling that time may be running out. An architect who used time to define the design of built form and human settlement was British architect Cedric Price. His best-known un-built project, the Fun Palace, begun in the early 1960's, was meant to be constructed using variable components that could be altered radically by its users. He also proposed a 'Pop-Up Parliament', a sketch of an infrastructural mega-building that would correspond to the ebb and flow of democratically elected representatives as well as the input and influence of the public. Many designers from the era pursued themes of instant, consumable architectural and urban components. Perhaps the most evocative wearable environment from the time was Archigram member Michael Webb's Suitaloon project, a succinct combination of tent and space suit. The London-based group, Archigram, launched a brand of pop architecture: instant cities published in

Short stay accommodation - M.P.s  
 offices - " + sects.  
 " - lobby correspondents etc.  
 Restaurant Bars, Rest rooms - Waiting Rooms  
 Commons - Chamber  
 2nd house - " Library + Computer  
 Rally area.



A sense of urgency suffuses the contemporary invention of visionary cities in the 21<sup>st</sup> century. Current ecological discussions often bring up the idea of the 'tipping point'. If climate warming continues, change could come suddenly and drastically, just as a bottle tilts until its stability is lost and it tips over, or a change of torque forces a spinning whirlpool to collapse suddenly into unsettled liquid. Below-sea-level nations—from the Maldives to the Netherlands—are exploring the idea of 'seasteading' and researching alternate city design. There is a renewed emphasis on merging landscape and infrastructure with the disciplines of architectural and urban design. And designers are referencing the natural sciences: biologist Janine Benyus introduced the term 'biomimicry' as a means to connect environmental design to rigorous scientific environmental research. Biomimicry relies on observation and

comic book form. Their schemes illustrated mass-consumed carnival architecture for a youth-oriented society, where fun-seeking structured daily life.

### Portable Architecture

The materials and tools, needed to craft portable architecture are all around us: plastic sheets, transparent tape, scissors and air. The late architect Jan Kaplicky, of the firm Future Systems, designed a light, elegant portable structure of bent fiberglass columns and plastic textiles for the British Museum of the Moving Image in 1991. With a two-day set-up time, it was mounted in a number of cities during the 1990's, but proved to be all too portable when set up in Manchester, where a strong wind blew it away. It was not moored to the ground firmly enough. Currently, many designers





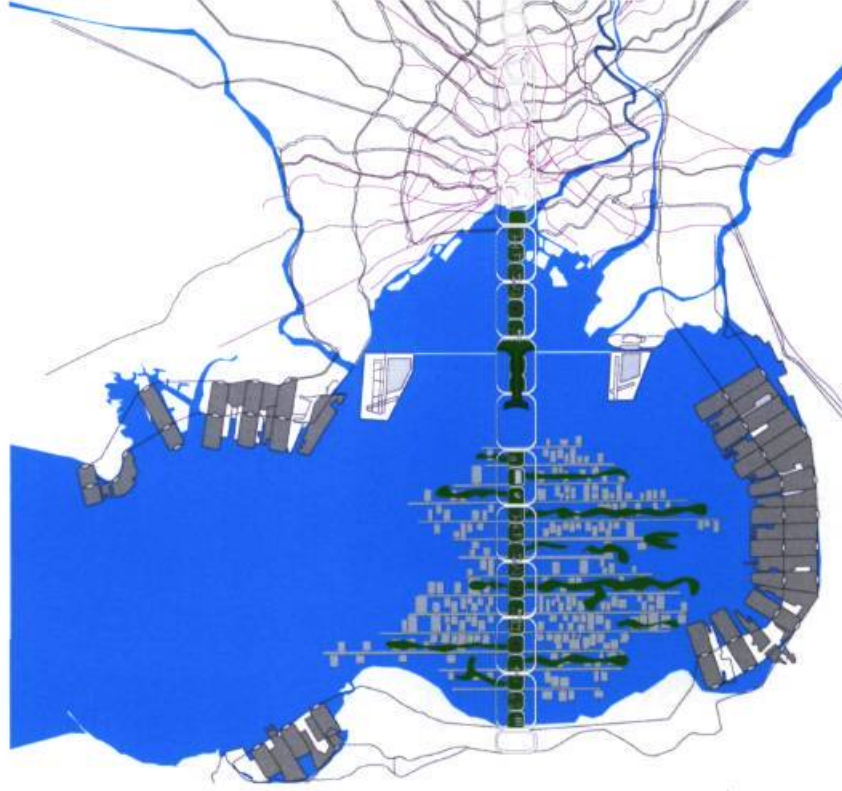
include a movable shelter design in their portfolio—including this author, who proposed a movable, inhabitable cell for persecuted writers in 1994.

The Berlin-based group, Raumlabor, recently designed and installed a series of instant, transparent spaces in a number of locations. In November 2008, they created an installation that functioned as a temporary party room for the 75<sup>th</sup> anniversary of the Swiss Pavilion, known as the *Fondation Suisse* in Paris. For the celebration, the Le Corbusier-designed five-storey student dormitory needed a large temporary space. Raumlaborberlin in cooperation with Luftundlaune/Zürich took advantage

of the famous open ground floor, to install 'Hovercraft-lifting modernism' on the ground, looking as if it propped the upper floors held up on pilotis, the large-diameter concrete columns. The illuminated plastic bubble squeezed out like gel toothpaste from underneath the edge of the overhang. In New York, Raumlabor set up a series of transparent structures using a truck named Spacebuster at the behest of the Storefront for Art and Architecture in 2009. The Spacebuster was a cube van equipped with a large inflatable membrane, ramp and fan beneath the ramp. The truck moved around the city hosting public events. The plastic bubble inflated from the rear of the van, like an in-







flatable tail. Accessed via the passenger door, it provided temporary festivity space for up to 80 people.

### Floating Cities

In 1960, Japanese Metabolist architect Kenzo Tange created a project for a floating city on Tokyo Bay. Artfully composed, stretched like a bridge across the bay, the strictly linear city contrasted with the curve of the shoreline, while raising the issue of how boats would get past it. Buckminster Fuller conceived of a huge floating tetrahedral city, also initially for Tokyo Bay, eventually developed for any maritime location. Fuller with collaborator Shoji Sadao, had dreamed of an enormous city-balloon floating through the atmosphere in the late 1950's. Tange's floating city, as well as Fuller's tetrahedral project, are examples of 49 visionary modern city projects, redrawn by the architecture firm called Work AC (Amale Andraos and Dan Wood). The contemporary architects analyzed and represented the series of city plans as graphic form, in a standardized colour format, published as a book, and exhibited at the Storefront for Art and Architecture in New York in April 2009.

The most common contemporary example of the floating megastructure is the oil rig—massive, ungainly, astounding struc-

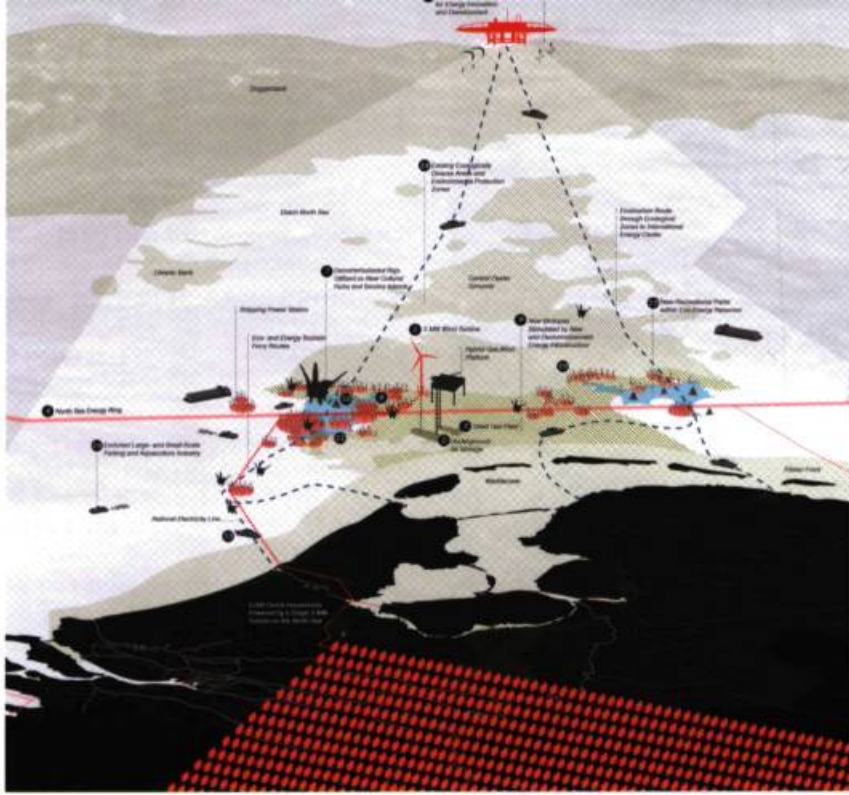
tures for resource extraction. Several varieties float off the coast of Newfoundland, and occasionally may be seen docked for refurbishment in the shipyards in Halifax. The largest, 224-metre-high Hibernia is a traditional rig with a fixed concrete platform. White Rose, as well as Terra Nova, is a FPSO, a Floating Production Storage Offshore vessel, floating on 120-metre deep water, with subsea resource extraction equipment stored in what is called a glory hole in the seabed.

Impressive in scale, the current generation of oil rigs would be dwarfed by an ocean-scaled proposal by OMA for a 'Zeekracht' (meaning seapower) Windfarm, an enormous infrastructural wind-farm to be sited in the North Sea, involving seven adjacent countries to create an energy super-ring production belt. The project proposes to enclose a nature reserve and include an International Research Centre, using a series of wind turbine structures anchored to the sea-bed, to define a frighteningly huge zone of electrical-power-generating components sited on the water.

Back at the scale of a city, British architect Peter Richardson of ZM Architects created a proposal for Solar Lily Pads, tethered in the Clyde River in Glasgow. His project used the under-used







waterway as site for a series of small artificial islands, places to mount solar panels. A good example of biomimicry, the lily pad shape optimizes efficient photosynthesis, and the design uses motors to rotate the discs following daily solar orientation. The new lily pad islands help regenerate the waterway, effectively locating solar power generating plants in the middle of town. The project won first place in the Land and Sea competition in 2008.

The appeal of the lily pad has spawned a whole series of floating island schemes. The idea of inhabited floating islands is reminiscent of the floating islands imagined in the C.S. Lewis tale, 'Voyage to Venus'. Danish architects PLOT, (Julian de Smedt and Bjark Ingels) published a Mermaid Island project in 2005, for a 50,000-square metre, floating spa island or Wellness centre, commissioned by clients, Taekker.

At a modest domestic scale, the architects MOS, (Michael Meredith and Hilary Sample, professors at Harvard and Yale respectively) designed a floating cottage built on Lake Huron in 2005. Their design of a simple, wooden two-storey cottage building floats adjacent to an island on the water, its buoyancy provided by a series of steel pontoons, drums located below the water level. The floating scheme solved the issues of transporting material to a remote site, as well as the problem of seasonally varying water levels. One might imagine whole colonies of this simple houseboat design, if lake levels continue to vary.

### Vertical Farms and Living Walls

An indication of the popularity of urban gardening is Michelle Obama's project to plant a vegetable garden on the White House Presidential grounds. In Montreal, McGill Professor Vikram Bhatt has worked successfully with students on an Edible Campus project for several years, creating an appealing campus landscape and donating the harvest to a volunteer organization that prepares meals for the needy, Santropol Roulant. Many Asian and European municipalities have enacted legislation to oblige property owners to add a green roof to existing and new buildings, in an effort to counter the Urban Heat Island Effect. The concentration of dark asphalt and concrete in large cities tends to raise the temperature of the local micro-climate. Planted surfaces modulate high metropolitan temperatures. An additional advantage of the green roof is the absorptive capacity of planted surfaces, reducing the load on storm sewage infrastructure.

Many green wall or living-wall buildings consist of plant mate-

rial affixed to the walls and roof, while others use the planted area for cultivating food or nurturing animals. The vegetal wall or building is one of the most widespread trends in architectural envelope design. One interesting example is by Japanese architect Taketo Shimohigoshi. The project proposed a Suspended Garden for Tokyo, stretching linear planting beds across the empty space between two buildings in contemporary version of hanging garden of Babylon.

Recent projects have depicted de-industrialized, shrinking cities with under-used infrastructure as new sites for urban agriculture. Front Office's Farmadelphia projects provide rhetorical images of this approach, while many underpopulated rust-belt cities actually go to seed. The antipode is the economically dynamic city seeking agricultural self-sufficiency with farming taking place in multi-storey buildings. The large-scale vertical farm adapts industrial farming to large-scale architecture. Many projects at the website, verticalfarm.com, use conventional large-scale tower plans and sections, then propose a series of farming devices to be installed on each floor. This is the approach of Chris Jacob's well-illustrated project, Skyfarming, on vertical farm web page managed by Columbia University professor Dickson Despommiers. The cylinder skyscraper tower accommodates the agricultural processes in a circular floor plate. Jacobs depicted a detailed breakdown of the elements that must be installed in a skyscraper that is entirely devoted to intensive urban farming. This kind of prototype raises many questions: since farming typically takes place on inexpensive, fertile land outside the city, does this scenario imagine a new scarcity of land? Would this intensive urban agriculture, housed in a multi-storey building, not use more energy? Why should such a building be mono-functional? This seems to imply a new scenario of stringent security issues related to food production.

Montreal-based architect Claude Boullévray de Passillé proposed a Plug-in Vertical Farm. Exhibited at Exit Art, the project combines the need to improve the urban public space of modern social housing in the East Village, aiming for biodiversity by providing a habitat for wildlife. Landscape designers such as Michael Hough have been concerned with the city as a place for native plants and animals for decades. DePassillé's proposal integrates habitat for wildlife with an artificially natural landscape, and targets the improved quality of urban public space for existing low-income residential architecture.





Peter Richardson, ZM Architecture. *Solar Lily Pads*, Clyde Rober, Glasgow, 2008.

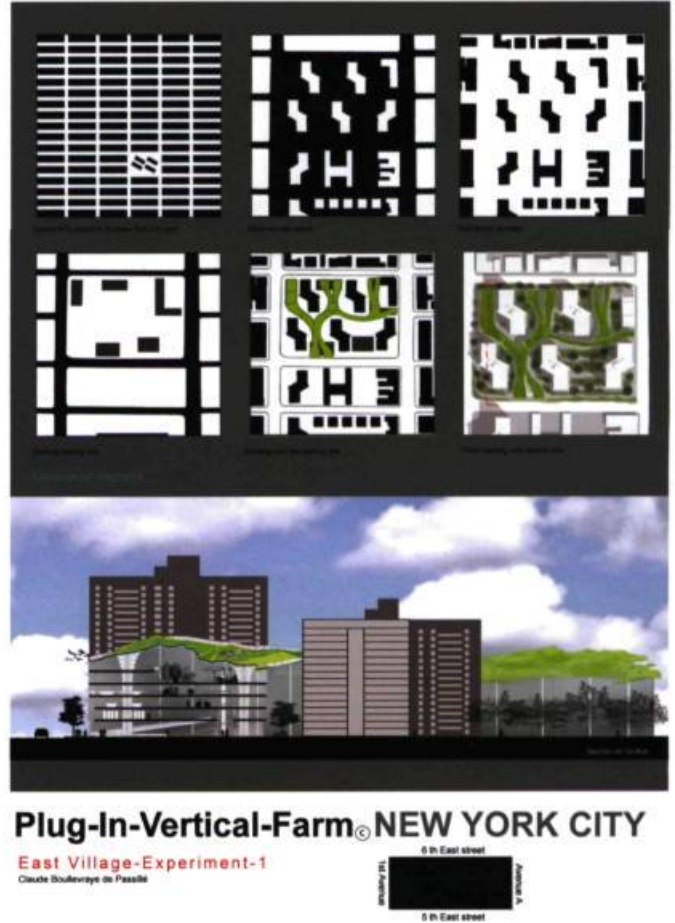
Parisian architects have built several successful planted walls in recent significant cultural buildings. In 2005, Architect Édouard François created an amusing vegetal wall on a 30-unit social housing project in Asnières, Paris in 2004. 'Tower Flower' placed cartoonish large flower pots filled with leafy vegetation on balconies all around the exterior. The firm R & Sie(n) designed a small, glass-walled laboratory in 2008, in the third *arrondissement* in Paris with an innovative system to nurture the plant growth in blown-glass vessels affixed to vertical surfaces. Patrick Blanc, researcher with the National Centre for Scientific Research in Paris, appears to have perfected a system used in the Quai Branly Museum of Anthropology by architect Jean Nouvel in Paris, and in the Caixa Forum in Madrid by architects Herzog & deMeuron. The British weekly *Building Design* described Blanc's method as 'botanical tapestry', where a correctly researched technique of planting is essential:

"His vertical garden design is composed of three parts: a metal frame, a PVC layer and a layer of felt. The metal frame can be hung on a wall or can be self-standing, and provides an insulating air layer. A 1-cm-thick PVC sheet is riveted to the metal frame, making the installation rigid and waterproof. Finally, a felt layer made from polyamide is stapled to the PVC. This felt is resilient against rot, and its capillary make-up allows water to dissipate through the material, feeding plants growing from its surface. Plants are installed on the felt as seeds, cuttings or already grown plants at a density of roughly 30 plants per sqm. Blanc selects the plants to suit the climatic conditions, whether these be in a building's interior or on the exterior. Water supplemented with nutrients is dripped through the felt from a small hose running along the top of the installation which is punctuated every 10-cm by a 2-mm hole. It's attached to a timer, while a gutter along the bottom of the installation collects the residue. The total weight is around 30-kg per sqm, allowing vertical gardens to be installed even on very tall buildings. For large spaces, the cost is roughly 600 per square meter (£480), plus labour, rising to around 1,200

MOS (Michael Meredith and Hillary Sample). *Floating House*, Lake Huron, 2005.



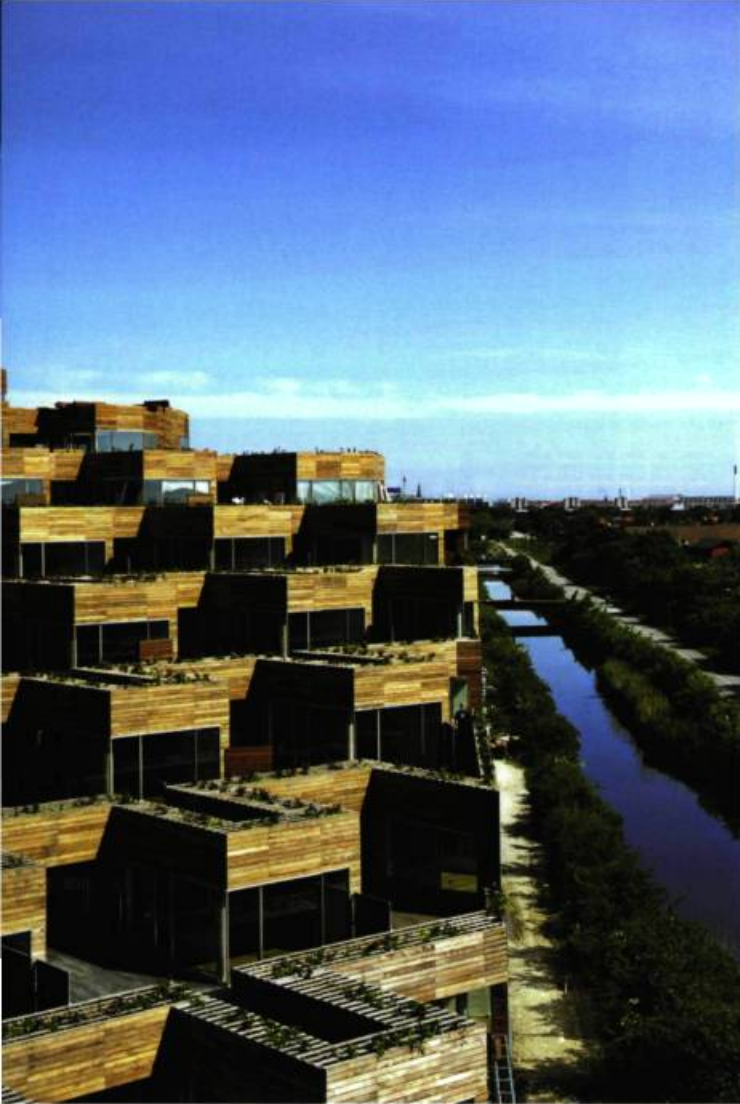




per square meter (£960) for an area of 40 square meters Blanc claims his walls will last at least 30 years.” Danish architects Julien de Smedt and Bjark Ingels, formerly founding partners of PLOT since 2006, split into two separate firms called JDS and BIG. Ingels and de Smedt designed and built VM Mountain Dwellings, in Ørestad, Copenhagen. Completed in 2008, it is known simply as the Mountain, a convincing terraced housing prototype. The innovative large-scale block blends building with the leafy landscape of city outskirts. The apartment structure takes the form of a large ziggurat-hill, steeply raked towards the south, with each apartment opening onto a southern

terrace with planting beds. The elevator is unconventionally positioned, traveling on an angle from the parking garage that forms the base of the building. The Mountain Dwelling is appealing market-priced housing that works as an urban landmark. On the West Coast, the design firm Mithun has proposed a prototypical urban farm high-rise, called a Centre for Urban Agriculture that integrates the vertical farm with a low-income dwelling project. It takes the form of a twenty-five storey slab on a podium, set on a triangular shaped urban site at Olive Way and Ninth Avenue in Seattle. The project integrates collection of water and re-use of wastewater, to achieve Net Zero Water, and





solar photo-voltaic panel on the south faces to achieve Net Zero Energy. The project's ambitious programme includes extensive roof gardens and greenhouses, laboratories, a biomembrane plant, a chicken farm, biodiversity gardens, even the re-use of containers as the fundamental building blocks of the social housing units. While issues such as the optimum height of such a projector the optimum floor plate size remains to be debated, the project bundles together crucial urban issues in a way that helps communicate the importance of convergence of themes involved: affordable, higher density, sustainable urban housing for the future of cities.

MARIE-PAULE MACDONALD

**Marie-Paule Macdonald**, an OAA-registered architect, holds a professional degree in Architecture from Dalhousie and studied urbanism with Françoise Choay in Paris, obtaining a post-graduate degree from the University of Paris VIII. She participated in organizing and exhibiting work in collective exhibitions and workshops such as *Man-size*, 1995, and *Anti-loft*, 2000, in Toronto, and worked in *Collectif dAb* for the *Quartier des Spectacles*, in Montreal in 2005. *Artexte* published her article 'Radical Environments of the 20th Century' in *Supplément*, 2008.

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- 1) Gardens
- 2) Water Tanks
- 3) Underpass
- 4) Cafe
- 5) Restaurant
- 6) PV Panels
- 7) Green Walls
- 8) Shipping Containers
- 9) Research Labs
- 10) Rain Gardens



South Perspective