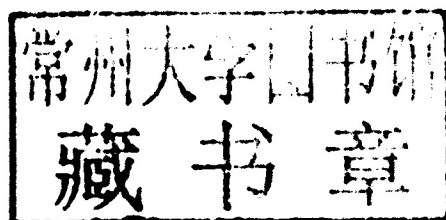# SKYSCRAPER COMPETITION

SKYSCRAPERS OF THE FUTURE
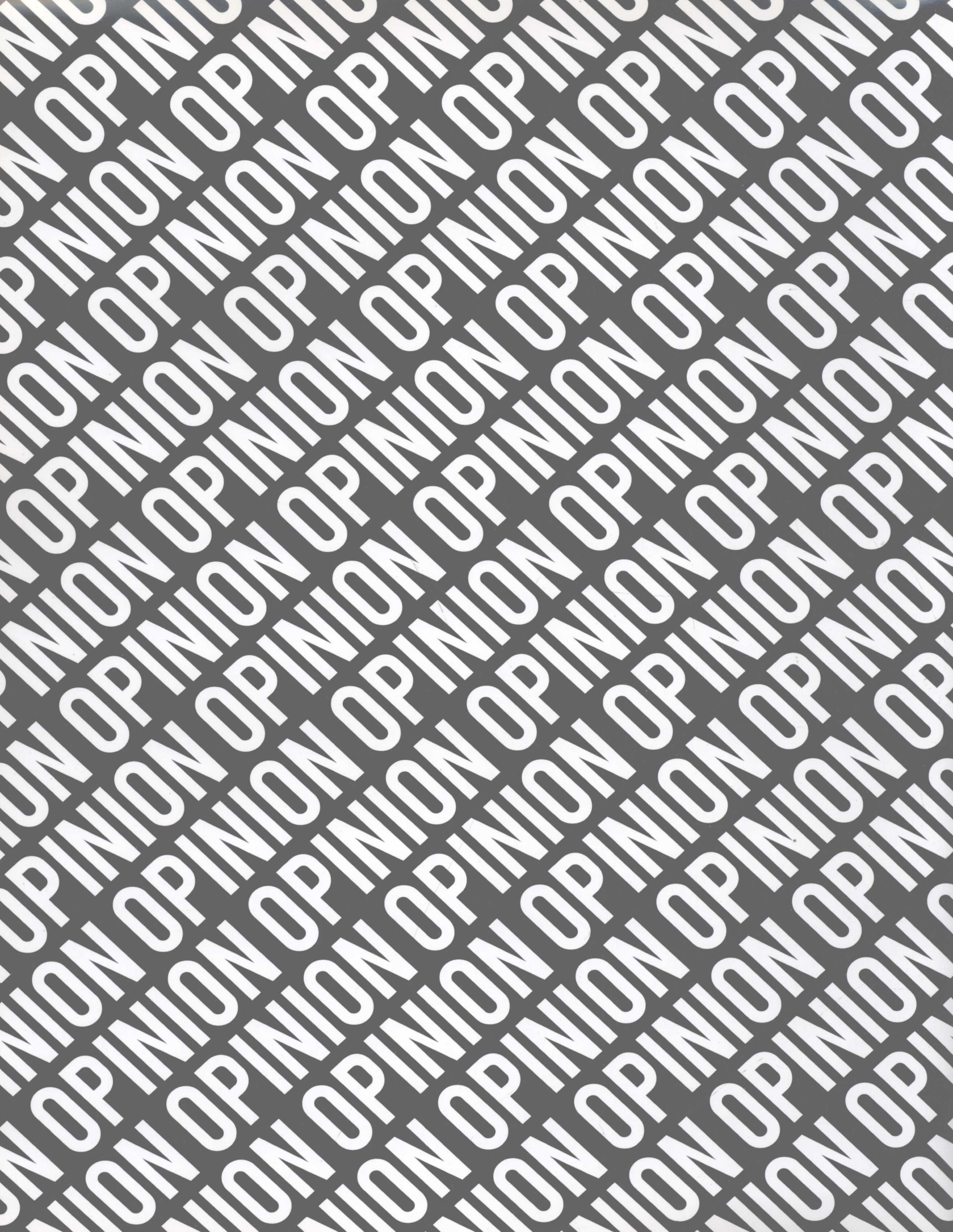
SKYSCRAPER COMPETITION

SKYSCRAPERS OF THE FUTURE

CREDITS

MAHANAKHON:
THE NEW 'GRAND METROPOLIS' OF BANGKOK

BY BRIAN AHMES CHAD PORTER

DRAWINGS AND IMAGES: COURTESY OF OFFICE FOR METROPOLITAN ARCHITECTURE / OLE SCHEEREN

01

Walking along the Sukumvit, a significantly visited street, a tourist perceived this grand metropolis. On all sides, the observer was framed with movement, activity, and stimulation. The sidewalk narrowed and expanded depending on the time of day and what businesses were in the area. At one point, a well dressed man with a fabric ruler draped around his neck vocalized, in broken English, the modest ninety nine American dollar cost for three custom Thai suits.

Bangkok is one of the largest economic and tourism hubs in Southeast Asia touting a population growth of almost four million people in the last ten years. The city was founded on the

Chaophraya River in the middle of the Fourteenth Century. Deeply rooted in Buddhism, temples such as Wat Arun and Wat Po were the tallest structures in Bangkok until the construction of the two-hundred-sixty-nine foot Dusit-Thani Hotel and Office in 1970. Because of its low construction and operating cost, skyscrapers boomed through the 1980's and 1990's producing Bangkok's tallest building to date in 1993, the Baiyoke Towers at nine-hundred-ninety-seven feet. Today, Bangkok is home to over one-thousand skyscrapers and currently ranks seventeenth of the world's tallest cities . With over a thousand of these skyward extrusions, nothing to date compares to the one-thousand-thirty foot luxury mixed-use skyscraper, the MahaNakhon.

In that same instance, an elderly blind woman carried a hand held karaoke machine singing classical Thai songs; guided through the dense pedestrian traffic by her son or relative, they petitioned a few baht for her performance. The side walk contracts, the air is thick and terribly humid. Young Thai men set up a make shift vendor wall clad with Prada bags, people bumped into one another and was difficult to pass through.

Translating to "Grand Metropolis," MahaNakhon press release states it will be approximately 1.6 million square feet, a landscaped outdoor plaza, 110,000 square feet of luxury retail space with lush gardens and terraces spread over

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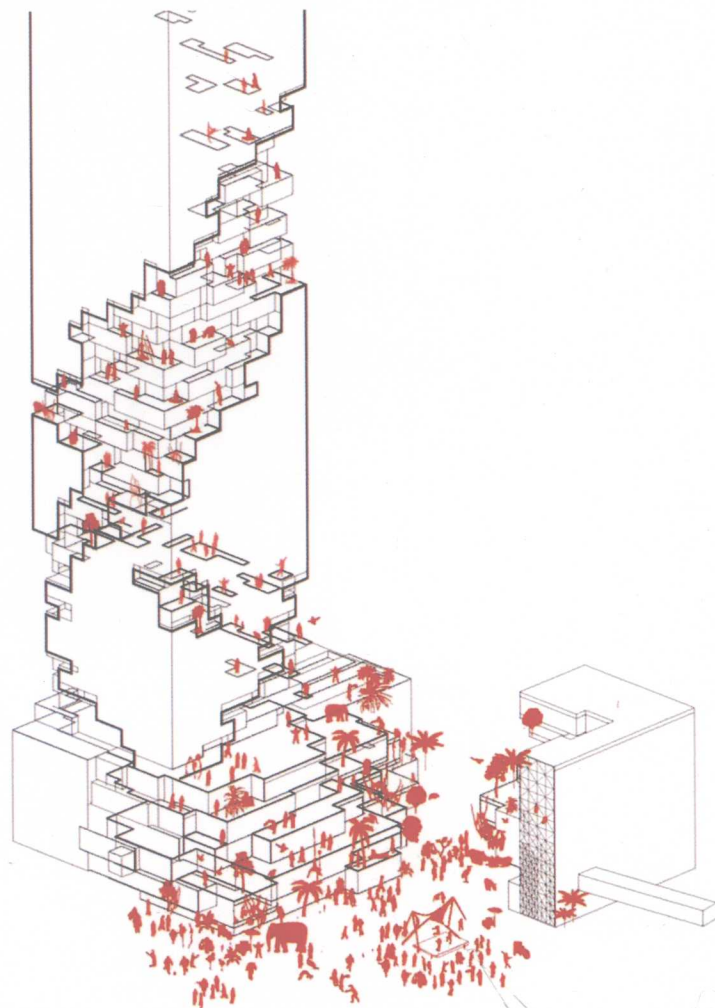
multiple levels for restaurants, cafes, and a 24 hour marketplace; The Ritz-Carlton Residences, Bangkok with 200 highly-customized single-level and duplex homes, each offering the atmosphere of a skybox penthouse, managed by the Ritz-Carlton and interior design by David Collins Studio with five-star amenities for all residences; The Bangkok Edition, a signature boutique hotel with one-hundred-fifty hotel rooms, a collaboration between Marriott International and renowned hotelier Ian Schrager; and a multi-level roof-top Sky Bar and restaurant . These residences are modestly price to begin around 840,000 USD, not too unreasonable for a *Farang* businessman or wealthy expatriate, but likely out of reach for the above average Bangkokian. Regardless of cost, living, dining, shopping, or visiting here will truly be a grand experience.

Across the way is the entrance stairs to the Bangkok sky train. Upon ascent, the tourist passed young Thai business people en route to somewhere important and a person missing their foot from gangrene, holding their crying grandchild begging for money. Waiting for the train, two tourists compared sites to see and agreed this metropolis is indeed a unique spectacle.

04

At first glance, this tower echoes a typical building incomplete in its construction phase. Lacking some fundamental aspects of the skin and building components, MahaNakhon gradually begins to reveal the innards of a working modern day mix-used tower. The plaza level, resembling a Miesian approach to skyscraper seen at the Seagram building, offsets from the streetscape providing a softer transition for visitors and everyday workers. Adjacent to the plaza, a smaller building component called the Cube intended as a meeting place and cultural events. The "pixilation" within the courtyard directly responds and communicates to the Cube and the tower.

Moving up the tower's podium, exposed detailed sections reveal overlapping floors and roofs from above and below. These terraces allow more outdoor areas and greenscapes that directly connect the occupants to the activity and life of the plazas and courtyards. MahaNakhon's vertical body expresses the historic intention of traditional skyscrapers, but reinterpreted idea. As seen with Herzog and de Mueron's 56 Leonard Street and OMA's 23 East 22nd Street in New York, redefines how a skyscraper can handle its inhabitants, not from just the internal environment but physically connecting them to the exterior. With, MahaNakhon, this "pixilation" is inscribed on the towers

Walking along the Sukumvit, a **significantly** visited street, a tourist **perceived this** grand metropolis. On **all sides, the** observer was framed **with** movement, activity, and **stimulation.** The sidewalk narrowed **and expan**ded depending on the **time of day** and what businesses **were in the** area. At one point, a **well dressed** man with a fabric ruler **draped around** his neck vocalized, in **broken Engli**sh, the modest ninety **nine American** dollar cost for three custom Thai suits.

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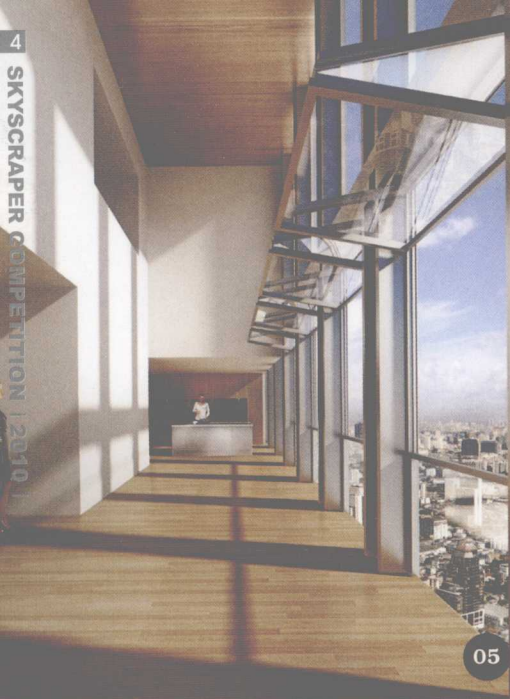
façade, leaving exposed a unique set of condos, hotel rooms and restaurants which are intricately positioned, formed and overlapped to express a reconfigured skyscraper exterior. The "pixilated" effect brings life and activity to the tower through public interaction with neighbors and courtyards engaging one another. Community is created in micro to macro situations, where the large scale city creates a community within itself, allowing MahaNakhon to represent a compacted scale with its occupants.

At the corner, a vendor sold pineapple skewers and chicken feet for only twenty-five baht, or seventy-five American cents. To the left on a city bench, three young monks, dressed in their bright orange robes, snacked and happily carried on a conversation. Further down the road, near the intersection, young Thai women hung out on the balconies of bars, coaxing tourists inside for a drink and conversation.

Aside from being one of the most luxurious mixed-use developments within Bangkok, the spatial relationships and architectural amenities reclassify the experience of vertical architecture. If not able to afford balcony options, residents would be trapped between planes of glass at the mercy of re-circulated air. To these clients, MahaNakhon floor to ceiling windows incorporate bi-folding balconies. Aside from the ability to regulate thermal temperatures, this feature, unprecedented in vertical architecture conjoins the interiors of the private residences to the city of Bangkok, inviting the cities distinct noises and smells. Previously with air tight seals and joints, the sensory connection to the urban environment, excluding vision, was nonexistent. For tourists, these sounds and smells become engrained within their traveling experiences and the faintest odor of chicken or diesel fuel recalls this sense of place and the joys or misfortunes of their travels. Residentially speaking, the daily moving from one skyscraper to another can become exhausting if the resident spends twelve hours working in one, two hours commuting by automobile or train to the other, three hours out to dinner, and seven hours at home (in a skyscraper); realistically spending anywhere from three to five hours outside. With MahaNakhon, if desired, residences open their windows, look outside and interact privately with the city.

As interesting as the bi-folding curtain system, are the communities created from the eroded facade. The staggering balconies and juxtaposition of different level living areas revive a previously lost relationship with skyscrapers. Before skyscrapers, when most residences were no more than five to eight stories in height it existed a different communal interaction; windows were open, neighbors communicated between levels, and people on the street called upon their friends and family. Although traditional high-rise residential designs incorporate sufficient residentially public areas such as gymnasiums, pools, and lounges it is not entirely guaranteed they will be used. MahaNakhon's eroded ribbon articulation encourages this inadvertent interaction between neighbors. More residences and tourist are made aware of and encouraged to communicate vocally and at least visually with their neighbors. Although other projects like 56 Leonard Street similarly articulate an eroding form, the level of resident to resident interaction is less encouraged because of the stacked relationship between units. The angle of the ribbon erosion exposes more adjacent relationships between residences and tourists versus the stacking of units.

The pixilation of the building's mass reflect-

ing upon its context exposes the layered depth of experiencing the city. A seamless edifice compares to a post card or freeze frame of a grand city, while the MahaNakhon begins to reveal its inner body much like touring a great city; a preconceived image of place that becomes subtly exposed through traveling the streets, meandering the allies, and riding the train. Most people within the Bangkok will experience MahaNakhon as a postcard or background; never penetrating or venturing within the eroded mega structure, however as a meeting place, icon, and background for photography this building will eventually synthesize within the context of Bangkok. Those affluent enough to rent a room or buy a condo will be shrouded with amenities and the ultimate vertical neighborhood experience. Without the traditional stack and fenestration; these tenants now have a more personal balcony relationship with each other. An interesting experiential move, we are curious to see the success of these adjacencies. MahaNakhon is a true innovation in architecture. Its form and structural system is puzzling, its curtain wall operates, and it is programmed with some of the most luxurious spaces. At one-thousand-thirty feet, MahaNakhon will also be the tallest building in Bangkok.

(1) Ultrapolis Project. "Worlds 25 Tallest Cities." Ultrapolis Project.
(2) MahaNakhon. "English Press Release" www.maha-nakhon.com.

01	Aerial view	06	Podium : retail, restaurants, bars
02	Concept diagram: pixilated amenities	07	Top view
03	Terraces	08	Aerial view: transportation hub, podium, building
04	Apartments		
05	Apartment interior: bi-folding balconies		

Brian Ahmes recently received his Masters of Architecture from the Savannah College of Art and Design. Recently, his team was awarded special mention for their entry in the 2009 Evolo Skyscraper Competition. His thesis on form generative surfacing was selected as "best graduation thesis" and submitted to the "Archiprix International 2009." He took place in several competitions in 2007 such as the Hobart Waterfront International Design Competition and the AIAS/ACC Transportation Hub Design Competition where he received an Honorable Mention. Academic projects have consisted of concepts for rebuilding the 9th Ward after Hurricane Katrina and designing with innovative energy efficient learning facilities. Currently, Brian works with HKS Architects in Dallas, TX collaborating on designs in the United States, Middle East and India.

Chad Porter is a recent graduate of the University of Oklahoma receiving his Bachelor in Architecture with a Minor in Spanish. Recently, his team was awarded special mention for their entry in the 2009 Evolo Skyscraper Competition. He is a member of the Cuban Chapter of the Council of European Urbanism and participated in the 2008 Havana Harbor Charette in Havana, Cuba considering what the city could do to revive its urban infrastructure. In 2006, he was awarded the Undergraduate Research Opportunities Grant for an exploration in Mexico City's transportation systems and proposed Firmament Networks, a third layer of people-movers above the city. In 2005, their studio's work, Digital and Interactive Architecture, was exhibited at Individual Artist of Oklahoma Gallery. He is currently employed at HKS Architects in Dallas, TX working in both the United States and Mexico City.
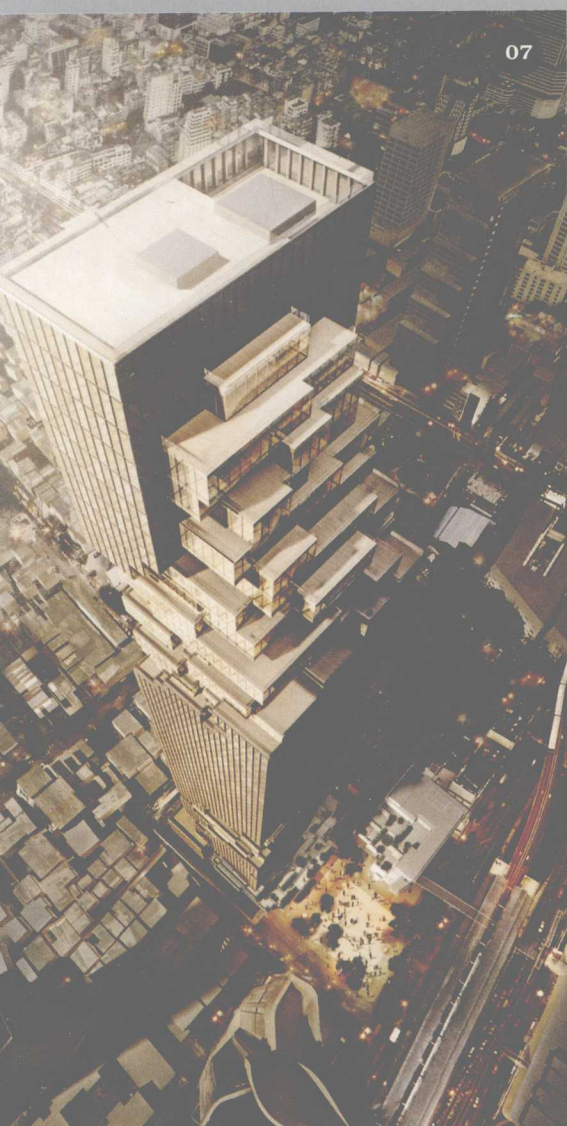
07

08

5

INDIGO TOWER

BIO-PURIFICATION TOWER

BY
BENNY CHOW
MOHAMED GHAMLOUCH
TED GIVENS

QUESTIONING NEUTRALITY

Even before the first pueblo fire was lit in the Los Angeles basin and the first cars arrived in Shanghai, the atmosphere was toast. The dirty yellow glow of Beijing and southern California, although capable of producing beautiful sunsets, stands as a troublesome reminder of an atmosphere in demise. Mere neutrality is not enough. The sheer mass of ineffective and bad building technologies has to be recalibrated and an over-correction applied. We are developing a building that moves beyond itself, and through an act of supererogation, attacks the more global conditions. One building can only have so much of an impact but a collective, that leads by examples and inspires other progressive green thinking, can truly make a difference.

This tower takes an active stance and attacks the problem of dirty air by aiming to help purify the air of our cities. The tower pulls dirt, grease, and bacteria out of the air, producing only oxidation and water as a result. The reaction is triggered by the use of a nano-coating of titanium dioxide on the outer skin of the project. The reaction is naturally powered by sunlight acting on the titanium dioxide during the day and supplemented by ultra violet light at night. These UV lights are powered by energy collected through PV panels during the day. 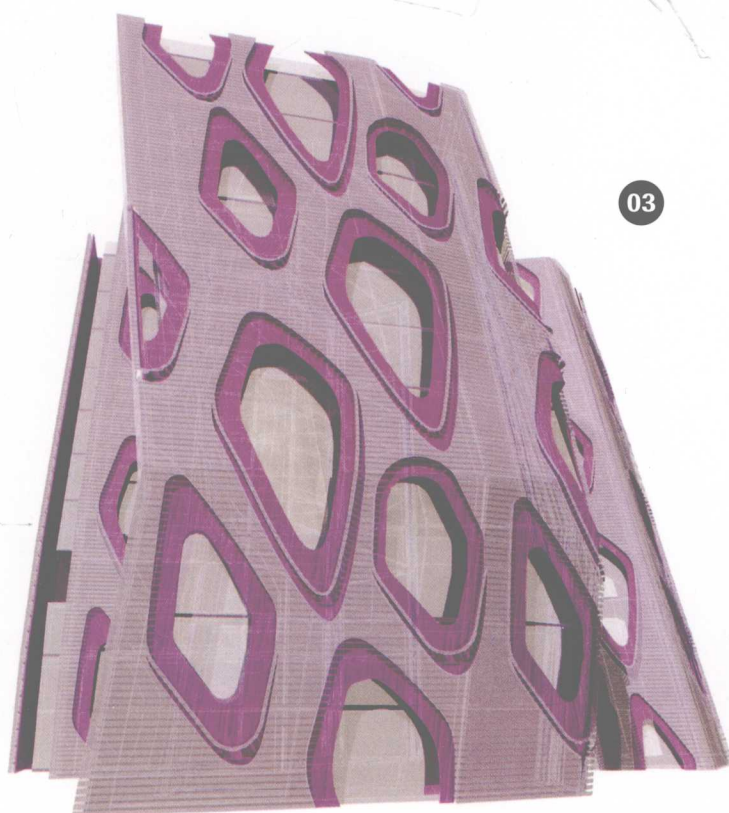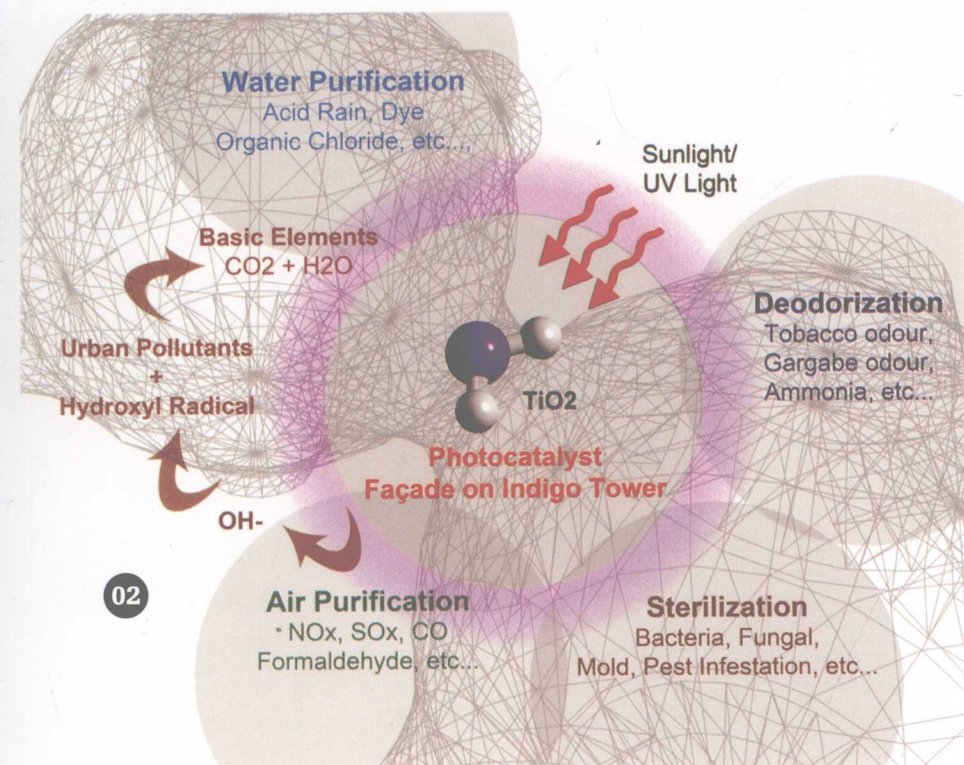The tower will be a glowing indigo object at night varying in intensity according to the amount of solar energy collected during the day. The indigo glow will become symbolic of the cleansing, counteracting the yellow haze that dominates the daytime hours.

The formal design moves of the tower are shaped by basic passive solar ideas that are amplified in magnitude, by a focused analysis of wind and light. Every twist and pull in the massing is set off by a series of interrelated environmental considerations. The passive solar attributes are enhanced by the additional layer of technological innovation provided by the titanium dioxide. Keeping the technology as simple as possible, we avoid the inherent traps of technological problems by piling on more technological solutions. We realize that the liberating aspects of the technological solution are often tied to the imprisoning traits that follow as a result of the solution.

The tower is split into three bars to 1) increase the amount of surface area, 2) provide southern light to the south face of each bar, and 3) focus and increase wind speed. The added surface area allows for maximizing the amount of titanium dioxide that can be placed on the building—enhancing the amount of air being cleaned. The focused and increased winds speed not only power a series of vertical wind turbines, but also pushes the air across the titanium dioxide panels and provides cross ventilation for every room of each unit in the towers. A positive pressure is created on the southern face

Water Purification
Acid Rain, Dye
Organic Chloride, etc...,

Basic Elements
$CO_2 + H_2O$

Urban Pollutants
+
Hydroxyl Radical

OH-

Air Purification
· NOx, SOx, CO
Formaldehyde, etc...

Sunlight/
UV Light

Deodorization
Tobacco odour,
Gargabe odour,
Ammonia, etc...

TiO_2

**Photocatalyst
Façade on Indigo Tower**

Sterilization
Bacteria, Fungal,
Mold, Pest Infestation, etc...

02

03

of the towers and the resulting negative pressure on the northern facades creates optimal conditions for cross ventilation. A series of wind turbines are mounted on bridges connecting the three towers. The air flow is compressed and directed by the form of the building to generate maximum wind pressure at the location on the turbines. The bridges are all two-story spaces, each containing a small garden to help mitigate the buildings internal humidity levels. The units are also two stories to reduce the amount of elevator stops needed for the building while creating a natural separation between living and sleeping. Each unit has both north and south facing facades to take advantage of the beneficial light and heat gain potential. The east and west facades have minimal glazing to neutralize low-angled and uncontrollable light.
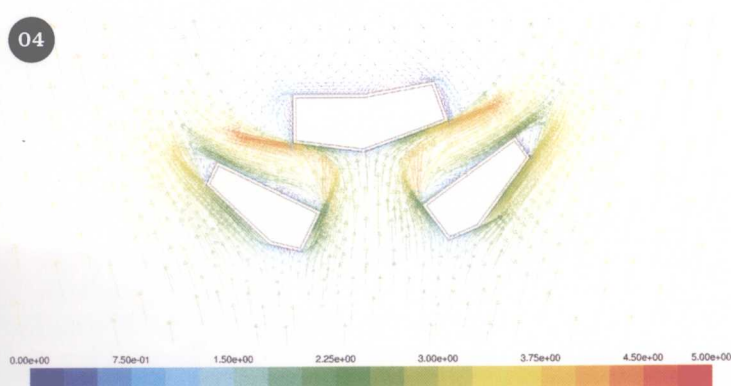
The skin design is inspired by the pocketed and cellular texture of the titanium dioxide molecule (TiO_2). A series of organic cells cover the building and are tapered to naturally collect the water, a byproduct of the skins chemical reaction, and to collect and slowly release rain water. The skin pulls off of the building on the south facades to provide natural shading and pushes into the inner skin of the north façade to maximize daylight and provide fifty percent coverage to reduce heat loss during the winter months. The skin also floats off the building to conceal the UV lights which can be harmful to humans who are directly exposed to it, and further maximizes the building's envelope.

A series of gardens are located at regular intervals all the way up the tower. They become public gathering spaces as well as marsh lands to collect the water from the chemical reactions of the skin and to filter and process grey water from the towers. The plants also turn the carbon dioxide, created in the chemical reaction of the skin, back into oxygen. It is paramount to have the plants help maintain the base-level carbon neutrality. A large pool around the base of the tower is the final collection point of the filtered water which goes to support a large amount of animal and plant life. Water is also pumped back up the towers from the pool to service toilets. Furthermore, the pool at the base acts as a heat sink for the release of the heat generated from a back-up air conditioning system. Here, the heat is released slowly, thus helps reduce the heat island effect.

We also propose the use of self-cleaning windows and bathroom tiles, which are available in the market for more than a decade. Scientists have been working on a solution on developing a "smart coating material" which can wash away dirt and keep the surface clean. However, it is not sufficient for the rapid urbanization we face. The ultimate challenge is how we can destroy the molecules of the pollutants, including nitrogen oxides, which are mainly the effects of heavy industries and automobile emissions.

The density of our large cities brings the

04


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0.00e+00    7.50e-01    1.50e+00    2.25e+00    3.00e+00    3.75e+00    4.50e+00    5.00e+00
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05


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0.00e+00      1.20e+00      2.40e+00      3.60e+00      4.80e+00      6.00e+00      7.20e+00      8.00e+00
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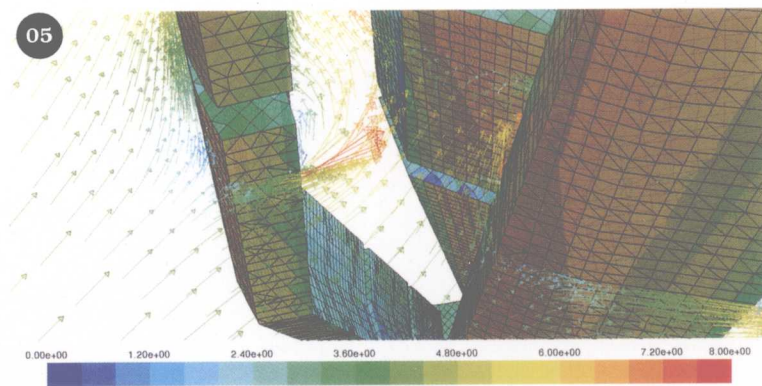
additional complication of transmittable disease. The nano-material we propose can also be used on internal hallways, trash rooms, and elevators to remove or reduce bacterial agents. In an age of globalization with more potent infectious diseases, a building that can help neutralize bacteria within it can help curb infection rates. SARS and now H1N1 have demonstrated to us that our buildings are not ready. A sanitized walk-off mat is simply not going to prevent the next global pandemic. The air streams that blow out of each individual unit, as a result of cross ventilation, are designed to disperse the contaminated air away from the building and prevent back flow into adjacent units.

With the advancement on today's nanotechnology, scientists can now modify and enhance the coating technology on building facade panels for incorporating the light activated nano-titanium dioxide (TiO2). The TiO2 based photo-catalysts can trigger a series of chemical reactions to generate hydroxyl radicals when exposed to sunlight or ultraviolet (UV) light. The artificial near-UV light source will give the maximum power on the photocatalyst reaction. These radicals will oxidize and degrade most of the airborne urban pollutants such as volatile organic compounds (VOCs) or nitrogen

oxides. They can even assist in deactivation of bio-contamination. This technology can make any surface anti-bacterial and mold-free. It can purify our ambient air and protect our buildings from bio-aerosol contamination.

The building is an explorative exercise aimed at taking full advantage of passive solar technique carefully married with the benefits of a titanium dioxide skin. The location of the project is set in Qingdao, China. Profitability will play a key role amongst investors in the shift towards our sustainable solution. We believe that coming out of a global recession, the consumer will be looking for a stable investment. The choice between purchasing a residential unit with a positive environmental attitude and not, will hopefully become a simple one. To get the product to market, significant tax breaks will be needed to help secure the positive direction the developers and consumers are looking for. Such architecture should be backed by progressive policy.

01	Aerial view: three towers	03	Façade detail: wind turbines, Titanium Dioxide coating
02	Purifying process using Titanium Dioxide as a coating for the façade	04	Wind flow analysis: plan
		05	Wind flow analysis: 3D

Ted Givens, AIA is an award winning architect who recently moved to Hong Kong to accept a job with RMJM. He is currently working on projects and invited design competitions in Dalian and Shenzhen China, and Northern Africa. Ted currently has a series of projects under construction in the United States from when he was a Design Director at Little. Ted received his masters from SCI-Arc in 1999 and an undergraduate degree from NCSU School of Design in 1995.

Benny Chow is RMJM's Environmental Design group leader in Asia. He acts as an in-house consultant for RMJM architectural design teams of Hong Kong, Shanghai, and Singapore. Benny has more than 14 years of experience in building performance simulations, including building's aerodynamics, daylight studies, solar heat gain control, and green building rating. Benny is currently a part-time lecturer at the Hong Kong University and Honorary Research Fellow of the Center for Infectious Diseases, Faculty of Medicine, CUHK, specializing in the aerodynamics of the medical environment.

Mohamed Ghamlouch graduated in 2004 from the Institut National de Beaux Arts in Beirut. He pursued architectural projects in several cities including Beirut, Dubai, and Shanghai where he worked on various projects ranging from private houses to large sports facilities. Mohamed is a senior architect at RMJM, Hong Kong.

This tower takes an active stance and attacks the problem of pollution by aiming to help purify the air of our cities. The tower pulls dirt, grease, and bacteria out of the air, producing only oxidation and water as a result.

PIXILATED
TECTONICS

Unitized Aggregation Techniques and Formal Organization in MVRDV's Rodøvere Sky Village and Herzog & de Meuron's Le Projet Triangle

RODØVERESKY**VILLAGE** | **LE**PROJECT**TRIANGLE**
COPENHAGENDENMARK** | **PARIS**FRANCE**
MVRDV | **HERZOG&DE**MUERON**

Text:
Elie Gamburg

Drawings and Images:
Courtesy of MVRDV and Herzog & de Meuron

"Maupassant often lunched at the restaurant in the tower, though he didn't much care for the food. It's the only place in Paris, he used to say, where I don't have to see it".

– Roland Barthes[1]

Roland Barthes opens his celebration of the Eiffel Tower's significance ironically, using Guy de Maupassant's wry, and oft-quoted, disparagement of it. Maupassant and his contemporaries disliked the tower because its structure, materiality, and occupation were not subservient to an overall, classical aesthetic conception that superseded their individual requirements. Rather, its form derived from the structural needs of building such a tall edifice, and its tectonic evolved from the material requirements of working with Cast Iron. It inverted the traditional hierarchy of form driving function. As such, the Eiffel Tower, even in its design, embodies Barthes' notion of the tower as self-referential sign: it signifies the internal logic of its own conception so much more clearly than any idea exterior to its own formation. Today, despite

its brevity, Maupassant's quip continues to evoke a central question behind high-rise design: should tectonics, program and occupancy derive from an over-arching, often iconographic, form; or should the form evolve out of their myriad requirements? Or, might there be some middle ground between these two extremes?

From the dawn of the skyscraper age there have been extreme responses to this question, as evidenced by the proposal of the iconic 'column' for the Chicago Tribune competition contrasted to the clean lines and efficient massing of the built scheme. Designers of skyscrapers during the modern era often attested that their towers' forms followed from an internally coherent logic of function, while designers of the post-modern towers of subsequent decades often returned to earlier notions of referential form and symbolism. This question remained relevant even during the recent boom, contrasting sculptural, computationally generated towers to their glass boxed brethren.

An emerging strategy of 'pixilation' might potentially synthesize or link the overall formal

conception of projects to the internal logic of their development, thus leveling the differing hierarchical relationships between the two. Recently this approach was used by both MVRDV in their competition-winning Rodøvere Sky Village and by Herzog & de Meuron in their proposed Le Projet Triangle. Understanding pixilation as a design model may offer a rich way to reconfigure approaches to tectonics and occupation of space. An expanding body of research explores pixilation, including BIG's 'Mountain Dwellings' -also in Copenhagen-, Herzog & de Meuron's own '56 Leonard Street' project in New York, and OMA's Bangkok 'MahaNakhon Tower', or latent in the surface of Jean Nouvel's New York 'Dream Machine' tower, among others. Characterized by a varied assemblage of small units, pixilated projects are all conceptually more similar to Moshe Safdie's Habitat than to the monolithic forms of such iconic stepped towers as the Sears Tower.

Conceptually, 'pixilation' begins with the systematic use of singular, repetitive elements to create larger form. These units can be manipu-

Rodovere Sky Village   view from main street

Le Projet Triangle – view from the *Peripherique*

lated; and while each is discrete, they only become 'pixels' when working together to render a larger form. Pixilation differs from other strategies of fragmentation, in that it atomizes program into units that are defined as the smallest and most efficient containers for a given use. Its underlying formal assumption is that the arrangement of its units is adaptable enough to optimally accommodate program, generating a striking overall form, with the potential of also being contextually responsive. MVRDV's project and Herzog & de Meuron's tower posit fundamentally different models of working with pixels, however. The approach underlying Le Projet Triangle is akin to the use of 'pixels' by such pointillist artists as Georges Seurat. Each dot contains a unique program (or color and luminance value, in the case of the painting) yet the arrangement of the units and one's ability to read them are subsumed by an overall form or image. Herzog & de Meuron's proposal is externally derived – its spatial and formal tectonic are overridden by ideas derived from references to the Eiffel Tower and

Paris's Hausmmannian grid. The pixels are used to make a recognizable form more ambiguous, contextually adaptable and humanly scaled. Conversely, Sky Village is more abstract, akin to the use of pixels by minimalist/conceptual artists such as Max Bill or Sol Lewitt, in which the accumulated points refer fundamentally to their own presence and formation. At its essence, MVRDV's proposal is self-referential, evolving principally from the implicit logic of pixel aggregation and manipulation. Interestingly, this internally driven logic fosters adaptability to context that rivals the externally driven model posited by Le Projet Triangle.

Sky Village's pixilated form is inconceivable without reading it as derived from a systematic arrangement of its constituent units. The pixel size is established as a 7.8m x 7.8m x 4m tall block – ideally sized to hold either, three parking spots, two hotel rooms, one small apartment, one office bay, or half a retail module, as required. The 36,000m² project, housing an evolving mix of these programs is conceptualized as a vertical 'village,' rising in a suburb of Copenhagen. With this metaphor, it is

no coincidence that the pixels also approximate a small single family home in size. Initially, the un-programmed units form a cube six units wide and long by eleven units high. The 6 x 6 arrangement in plan allows for a central 2 x 2 core zone, wrapped by a two-square deep perimeter.

Assigning pixels to each program type, starts a game in which units are repositioned from around the cubic block to other points above, below, or adjacent. Programmatic optimization initially governs the rules of this game. Allowing the two-square deep perimeter blocks to remain together provides deeper office bays. Light is supplied to the units further away from the building perimeter by removing blocks to create communal terraces accessible from remaining office blocks. Removed units are then 'added' back to the top of the building. The relocated pixels are 'reprogrammed' to create a myriad of residential unit types, from small hotel rooms to larger suites, from economy apartments to larger dwellings. The staggered relationship of these volumes to one another makes the roof of each exposed unit a terrace for the next.

The way the game starts seems to confirm the programmatic adaptability of 'pixilation' as pursued by MVRDV. However, the architectural trope of 'unitized flexibility' used to justify pixel buildings from Habitat and the Japanese Metabolist projects of the 1960s to those of today has always been somewhat fallacious, despite its formal potential. Reorganizing set units allows designers great flexibility in meeting varying conditions, on paper. However, once built, the pixel project no longer has the flexibility of usage that generic open-floor-plate buildings maintain long after completion. This lack of post-occupancy flexibility has placed Kisho Kurokawa's Tokyo Nakagin Capsule Tower in such risk, even as older warehouse buildings across the world are routinely repurposed as apartments or offices. Once completed, the double-deep units of Sky Village will always work best as offices, and the staggered single units near the top will always preference residential or hotel programs, depending on their arrangement.

Program may drive the design originally, but the subsequent reorganization of the pixels is not derived from spatial flexibility as much as from contextual adaptability. The small units allow for precise manipulation of form and space that are perfectly suited to respond to specific contextual inputs. If only program governed pixel arrangement, a more symmetrical and static project would have emerged. Sky Village's form does not offer especially efficient and open office spaces and apartments, but is notable in how it can provide them with terraces and natural light. The tower's pixilation means that, within the logic of its own design, it can be systematically cut-away on the ground level to create a public plaza, without creating a separate 'base' condition. Similarly, it leans towards the area's main street, while, at the same time, creating a pinnacle with views to and from the other important buildings in Copenhagen. Sky Village's pixels are not only the sum of its programs; they evolve as a collection of specific contextual responses to adjacent streets, its plaza

Le Project Triangle - pixilated tectonic