Chong Qing
Nan Lu Towers

by mam
<table>
<thead>
<tr>
<th>Practice:</th>
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<tr>
<td>Designers:</td>
<td>Marjan Colletti and Marcos Cruz</td>
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<td></td>
<td>Colletti and Cruz contributed equally to this project through their collaborative practice, mam architects.</td>
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<tr>
<td>Title:</td>
<td>Chong Qing Nan Lu Towers</td>
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<tr>
<td>Output type:</td>
<td>Design</td>
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<tr>
<td>Function:</td>
<td>Skyscraper incorporating residential, commercial, retail, hotel and cultural programmes</td>
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<tr>
<td>Location:</td>
<td>228 Peace Memorial Park, Zhongzheng, Taipei, Taiwan (Republic of China)</td>
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<tr>
<td>Client:</td>
<td>Glory Yeh Art Park Ltd, Taiwan</td>
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<tr>
<td>Commission date:</td>
<td>2010; project currently on hold</td>
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<td>Size:</td>
<td>Three towers at a peak height of 157m with 35 floors and 7 floors of basement, 6,500m² footprint. Total floor area 150,000m².</td>
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<td>Collaborators:</td>
<td>Ergin Birinci, David Edwards, Aleksa Rizova and Tze-Jun Wei</td>
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Statement about the Research Content and Process

Description
This design synthesises residential, financial, commercial, leisure and cultural uses in a cluster of towers, which incorporate a lexicon of innovative architectural devices to reinforce the building’s structure and programme. Its ‘boomerang’ morphology develops a varied visual mass and structural footprint for its mixed use, and its digital and environmental design techniques aim to contribute a new approach to emerging discourses of vertical urbanism.

Questions
1. How can architects’ briefs positively influence the development of Taiwan’s urbanism?
2. How can an innovative mixed programme unite disparate historic and commercial parts of the city, and contribute to their regeneration?
3. How can research into vertical green environments, vernacular structures, patterns and functions be integrated into a building design?
4. How can traditional Chinese courtyard housing inform the design of high-rise apartments?
5. How can biomorphic design shift beyond formal concerns to proposals that are typological, environmental, programmatic and contextual?
Methods

1. Contextual analyses of Taipei’s varied political, historical cultural and urban characteristics.

2. Comparative analyses of the city’s density and low-rise urban typology, in contrast to other global, dense cities (e.g. Tokyo, Shanghai, New York and London).

3. Iterative design that combined client dialogue, digital computation and the translation of Asian nature symbolism, with studies of massing, mixed-use programmes and structural references to local urban contexts.

4. Development of a ‘boomerang’ morphology to synthesis these concerns, and porous building ‘skin’.

Dissemination

The work was presented to Taiwanese and Chinese media, politicians, architectural critics and local residents. It has also been the subject of national and international keynote presentations and invited guest lectures in Berlin, Lisbon, Atlanta, Madrid, Taipei, Edinburgh, Tainan and Taichung.
Perspective of Chong Qing Nan Lu Towers within Taipei’s cityscape
Introduction

The pervasive proliferation of western-style skyscrapers across Asia, often thought of as symbolic beacons of progress, has dramatically reshaped skylines. Usually, however, these developments are uniform and exclusive enclaves, private spaces isolated from the historical, social and cultural context. This proposal articulates a different model of development for Taipei, which remains a low-rise city constrained in a basin between two narrow valleys.

Chong Qing Nan Lu Towers is a highly complex brief sited within a sensitive historic urban fabric. The design synthesises residential, financial, commercial, leisure and cultural uses in a cluster of towers, which incorporate a lexicon of innovative architectural devices to reinforce structure and programme: a ‘boomerang’ morphology with pleated structurally active skin for reducing the visual mass and liberating the core structural footprint. The tower’s terraced podium enhances the public realm, incorporating cantilevered arcades and vertical green spaces and new residential typologies that maximise shared spaces through ‘inhabitable’ interfaces. [fig. 1 & 2]

Aims and Objectives

The overall aim was to develop a design-led, environmentally responsive approach to high-rise buildings in Asian cities, contributing an engagement with context to the emerging discourse of vertical urbanism. There were three particular objectives:

Analysis:
To question the uncritical insertion of unsuitable western typologies of skyscrapers across Asia and to ask what other high-rise models might better support urban continuity and civic relationships. To conduct a comprehensive site analysis, identifying problems and potentials, to address its historical, physical, environmental and social characteristics, including experiential qualities. To conduct a comparative study of high-rises in Taiwan and other Asian and global cities to understand critical debates about contemporary developments.
**Synthesis:**

To explore new building typologies and morphologies that correspond specifically to Taipei’s climate and culture.

To bring these elements from the site analysis and comparative study into the proposal from concept to detailed design, from volumetric calculations to programming, innovating through a lexicon of architectural devices embedded in a biomorphic tradition, but emphasising the specific and original parameters of context, programme, environment and space, rather than generic computational language.

**Catalysis:**

To make visionary but viable suggestions for a vertical model of urbanism that is dense yet green and open to pedestrian life.

To encourage a creative reconsideration of the city by presenting these elements to key stakeholders in Taipei, such as Glory Yeh Art Park Ltd, a private Taiwanese client known for investing in integrated, mixed educational, cultural and housing programmes (e.g. the Glory Yeh Art Park in Hsinchu). The proposal is highly specific to the contextual conditions at the centre of Taipei, but was understood as a model to be repeated across Taipei and in similar historically sensitive sites in Taiwan. It could further be implemented in the broader Chinese cultural context.

**Questions**

1. How can architects’ briefs positively influence the development Taiwan’s urbanism?
2. How can an innovative mixed programme unite disparate historic and commercial parts of the city, and contribute to their regeneration?
3. How can research into vertical green environments, vernacular structures, patterns and functions be integrated into a building design?
4. How can traditional Chinese courtyard housing inform the design of high-rise apartments?
5. How can biomorphic design shift beyond formal concerns to proposals that are typological, environmental, programmatic and contextual?
Context

Site
After a century of rapid development, Taipei has become a fragmented city without a dominant centre: it is a city ‘without a face’. The municipal public plan encourages unification of the city by combining underutilised plots and opening them up. The 6500m² brownfield site for Chong Qing Nan Lu Towers lies within Zhongzheng District, part of Taipei’s old town, containing fragmented and small areas of well-preserved historic urban fabric, situated on the north-west corner of 228 Peace Memorial Park (which is named after a key historical anti-government uprising in Taiwan’s modern history). The site features a nondescript mixture of existing residential and commercial buildings adjacent to significant governmental and cultural buildings, including the National Museum of Taiwan, Presidential Palace and gates into the old city.

Computational modelling
Digital modelling and fabrication processes have revolutionised architecture, giving rise to avant-garde parametric and biomorphic designs on an urban scale in proposals, including: Zaha Hadid’s Kartal Pendik Masterplan, Istanbul (2006); KOL/MAC’s Project MUTEN İstanbul, Galataport (2006); and specific high-rise building proposals: e.g. Ali Rahim’s Residential Housing Tower and Commercial Office Tower in Dubai, UAE (2004). [fig. 3 & 4]
Chong Qing Nan Lu Towers
Site photos of 228 Peace Memorial Park and existing residential and commercial buildings
Image in the public domain via Creative Commons
Methods

Analysis

a. Contextual analysis
Taipei City is the political, economic and cultural centre of Taiwan, and home to over 2.5 million people. It is situated at the tip of the island between two valleys within a river basin that experienced rapid urban growth in the first half of the 20th century under Japanese colonial rule and rapid economic growth in the second, transforming the country into one of the Four Asian Tigers.

Japanese rule introduced a coexistence of traditional Chinese, Japanese and Western architectural styles, including a typology unique to Asian streets lined with arcades of vaulted roofs and pillars, providing a continuous public realm which unites the fragmented, incoherent city. The arcade encourages informal activities which give the city its vibrancy, acting as path, market, bar and canteen, and using active shallow façades and adjoining shops where retail mixes with living rooms, bedrooms and kitchens. [fig. 5–7]

b. Comparative study
Examples from European cities prove that historical city structures can coexist with new hyper-dense high-rise. Compared with cities from Asia and the Americas that have taken a tabula rasa approach to new construction, Taipei lacks a sense of identity in its skyline and cannot contend with continental forces of growth without significant high-rise development.

The pervasive proliferation of western-style skyscrapers across Asia from leading figures in architecture has dramatically reshaped skylines, symbolising beacons of progress yet continuing the uniform exclusivity of these enclaves, separated from historical, social and cultural context. Emerging critical debates on the diminishing public realm, atomisation of social spaces and gentrification rarely feed into design proposals.

Taipei is a high-density, low-rise city with an emerging verticality that acknowledges Buddhist symbolism in form and ornament without necessarily registering local patterns of inhabitation and informality that shape the city. For example, Taipei 101 combines the form of the pagoda and bamboo flowers in its eight sections, a number denoting blossoming and success. [fig. 8–10]
5 Historic site photo showing different modes of urban signage and shallow, informal shop frontage uses

Image in the public domain via taipics.com

6–7 Site photos showing different modes of urban signage and shallow, informal shop frontage uses
Chong Qing Nan Lu Towers
Taipei’s low-rise skyline compared with Shanghai and Tokyo
Image in the public domain via Creative Commons
11 & 12
Elementary conceptual sketch and 3D render of the lotus flower architectural gesture
Synthesis

The design developed through five iterations, in close consultation with clients. We used elementary sketches, 2D and 3D CAD models (Rhino and AutoCAD), 3D SLS scale models and multi-perspectival contextual illustrations (Illustrator and Photoshop). Constant computational modelling was an essential part of the design process. This generated varied morphological and typological iterations to sculpt the three-dimensionality of the programme and its mass.

a. Concept

The architectural concept grew from observing the Lotus flower, a Buddhist symbol of the exalted state of man – his head held high with feet rooted in the world of experience. This was expressed through the differentiation between podium and towers in the early design sketches (the podium rooted in historical context and towers signalling a new future). This conceptual image, however, was not understood in a literal, formal way. The organic and textured outer surface of the building were shaped with a series of creaks, folds and pleats, taking its form from other plants, e.g. the bark of the sequoia tree and surface patterns of corals, as well as synthetic patterning from high fashion. [fig. 11 & 12]

b. Volumetric massing

Massing studies used digital modelling technologies, starting from a simple extrusion of the site as a monolithic rectilinear tower of a maximum envelope, and developing into a set of volumetric limits which are incrementally divided, chiselled and sculpted to disrupt the mass and dissolving edges, and shaped to reflect the site’s context, views and depth.

The design begins to expand the architectural vocabulary of its surrounding space by expressing the threshold condition between a historic park (on the back side) and commercial district (on the opposite front side). Drawing on organic and synthetic patterning, it brings in movement and texture in ripples and folds, which disrupt the mass of the towers, bringing the park ‘organically’ into the building, and feeding into environmental studies.

Multiple towers begin to interlock and overlap, allowing shifting views from the street and tower in chorus with one another. The proposal offers a range of faces according to perspective: elegant vertical pleats reinforce verticality from the rest of the city, and horizontal terraces face the public square reducing perceived scale of building. [fig. 13–15]

c. Programmatic organisation

The proposal shifted dramatically over the course of two distinct methodological design phases. The first was a speculative vision, after invitation by the client. The second developed through this close consultative process whereby the research process shaped the programmatic brief in collaboration with the client. This methodological relationship resulted in a dynamic client brief. The initial proposal mixed commercial and residential programmes but, as cultural and retail functions and a hotel were later introduced, these programmes compartmentalised in subsequent stages to allow for separate entrances and management of volumes.
Massing studies using perspectival views in context, developing from a single block to pleated, twisting multiple towers.
Elevation study.
Contextual sketches and plans showing major diagonal axial routes and permeability for pedestrian and transport links
The design enhances the permeability of the site, responding to two diagonals on horizontal and vertical planes. The diagonal axis that breaks through the orthogonal grid of the park sets up the axial route across the site bisecting the podium of the scheme. The vertical geometry is assessed through elevation studies, demonstrating the necessity for the building to act as a mediator, reconciling the disparate scales of the build environment by creating a gradient of height from the modernist 76-storey Gate of Taipei 1 Towers, to the postmodern 51-storey Shin Kong Life Tower, and to the low-rise baroque Presidential Office Building.

The building responds to its various urban contexts, changing in mass, volume and pattern. The development is denser on the north side, facing on to the busy Xiangyang Road, reducing towards the southern side by the park. From the main street of Xiangyang Road and northern commercial district, the building’s verticality is enhanced by vertical pleating. Stepped horizontal terraces reduce the scale as it opens to the historic district and park, drawing it into the site through a green façade that blends the buildings into their natural surroundings, and minimising its impact on the delicate context of local symbolic and cultural buildings.

The programme is divided into three towers which are joined by an extended podium blending the residential, commercial, financial, cultural and leisure, while allowing a separate management of volumes. The tallest 29-storey tower of residential duplexes is located on the northern side. The outer edge of the boomerang faces the busy Xiangyang Road allowing the inner, concave façade to support sheltered terraces on the calmer southern side. Landmarks located strategically at the base of the tower facilitate orientation; a bank on the busy western corner and cultural centre on the highly visible eastern elbow create a cultural boulevard linking it to the National Museum. The two smaller towers mix housing, offices and hotel space, sloping southwards to form a larger enclave of balconies, which swells at the base to a terraced public podium on the upper and lower ground floors. A parade of shops line a mews that allows Yuanling Street to extend into the site. [fig.16–25]
Contextual perspective demonstrating how the major diagonal axial route through the park is drawn into the proposal 20 Perspective view from the park
Arrangement of balconies within residential units

Floor by floor programmatic diagrams articulating circulation patterns

Methods
Development of boomerang plan form with façade treatment and accommodation breakdown
d. Design lexicon

‘Boomerang’ morphology: Digital modelling and SLS printed models were used to develop the three towers’ morphology of a ‘boomerang’, a geometry employed for spatial and structural reasons, offering dual-aspect internal space and facilitating cross-ventilation, while reducing the structural core and maximising enclosures.

The structural development passed through two distinct stages. First, it articulated in a series of columns and cores based on a foundational structural grid, together with a lighter perimeter skeleton that forming the envelope. Key structural floors stiffened the whole, using cores and localised shear walls to provide bracing. This led to a series of tests of a bifurcating skeleton, akin to a tree, that divides and branches into smaller units as it rises. The advantage of this arrangement allows for larger civic spaces on the podium free of columns without impacting on smaller residential and commercial units above.

The porosity of the building’s ‘skin’ responds to programme and adjacencies on site. It represents a series of surface ‘petals’ with inner and outer mesh panels that vary in transparency and density, to pleated cladding which is structurally active. This skin can be adapted for detailing. The cultural centre becomes a focal point of arrival by lifting back the drape of the pleated façade. The skin is punctured by balconies, which are arranged in a non-hierarchical order across the glazed surface. This detailing of the exterior reinterprets the richness of Gaudí’s bourgeois housing schemes and the rhythm of the undulating, permeable ‘gills’ of Herzog and de Meuron’s Hamburg Opera House. [fig. 26–36]
Section through three boomerang towers

Chong Qing Nan Lu Towers
Perspective breakdown of structure and pleated skin
Studies of building skin in porosity and transparency
Methods
Development of pixelated skin with environmental performance and perimeter structural detailing
Elementary sketches developing the arcading between object and podium, extending into plan and sectional studies.
Terraced podium: The podium takes the experiential qualities of Taipei’s informal public spaces and enhances them through cantilevered arcades, stepped terraces, and vertical greenery.

The public is invited into the envelope of the building through cantilevered arcades forged from overhanging towers which protect, but do not enclose, and reference the arcades that hold the city’s vibrancy, and enable small-scale, pedestrian and slow-paced movement. The retail units of the shopping arcade’s interior face out, maximising street frontage and pedestrian circulation.

The public is invited through the building by the creation of routes defining a new internal public realm, which extends the ground floor plane into a multi-layered terraced podium of upper and lower decks, and echoes the rice paddies that used to dominate the Taipei basin.

The park grows into the building, taking over the atrium and façade, dissolving the boundary of inside and outside with tree-like columns disrupting the distinction between nature and architecture. The enclosed parkland becomes an arboretum, extended onto the balconies, and developed through folding planes and inserted vessels creating three-dimensional spaces and allowing light to filter through. [fig. 37–45]
41 & 42
Perspective views from park and within proposal

43
Internal perspective of cultural centre atrium walkways
44
Perspective of internal atrium of balconies

45
Perspective demonstrating horizontality of podium extending into external balconies and transparency of rising floors
Arrangement of residential duplexes

Residential floor typologies
Residential typology: The project incorporates innovative residential typologies built on previous research into inhabitable interfaces, exploiting the opportunities of extending and occupying boundaries.

The design reimagined the courtyard arrangement of traditional Chinese housing clustered around a square. This was first articulated in a vertical alcove antechamber puncturing into the building’s skin, giving a shared space for two duplexes to leave shoes outside, with stairs that rise to one flat and fall to another. The second iteration was a central circular apartment layout as entrance, living, dining and balcony space allowing for peripheral inhabitation, which echoed the organisation of retail units in the podium, and reinterpreted the central courtyard logic of Toyo Ito’s U-House. The internal stairs worked to orient and control the arrangement of the duplex, integrating storage into side-walls to maximise the efficiency of each unit. [fig. 46–55]
48 & 49
Typical residential floor plans and rectilinear apartment 3D views
50–52
Plan and sectional tests of circular apartment layouts developing from traditional Chinese residential squares
Dissemination

The work has been formally presented (2011) to Taiwanese and Chinese media, politicians and local residents, including: the Chairman of Taipei Culture Foundation (former Vice-Mayor of Taipei and former Director of Cultural Affairs); the former head of the Urban Planning Commission of Taipei; a key Taiwanese urban and architectural design critic.

It has been presented in national and international keynote presentations and invited guest lectures at:

University of the Arts, Berlin, Germany (2011)
Faculdade de Arquitectura, Universidade Técnica de Lisboa, Portugal (2011)
Tamkan University, Taipei, Taiwan (2011)
Georgia Tech, Atlanta, USA (2012)
Universidad CEU San Pablo, Madrid, Spain (2012)
Tunghai University, Taichung, Taiwan (2012)
Edinburgh Science Festival, Edinburgh, UK (2013)
National Cheng Kung University, Tainan, Taiwan (2013)
Feng Chia University, Taichung, Taiwan (2013)
Bloom
by Alisa Andrasek and José Sanchez

House of Flags
by AY Architects

Montpellier Community Nursery
by AY Architects

Design for London
by Peter Bishop

2EmmaToc / Writtle Calling
by Matthew Butcher and Melissa Appleton

River Douglas Bridge
by DKFS Architects

Open Cinema
by Colin Fournier and Marysia Lewandowska

The ActiveHouse
by Stephen Gage

Déjà vu
by Penelope Haralambidou

Urban Collage
by Christine Hawley

Hakka Cultural Park
by Christine Hawley, Abigail Ashton, Andrew Porter and Moyang Yang

House Refurbishment in Carmena
by Izaskun Chinchilla Architects

Refurbishment of Gacrimuñoz Castle
by Izaskun Chinchilla Architects

Gorchakov’s Wish
by Kreider + O’Leary

Video Shakkei
by Kreider + O’Leary

Megaframe
by Dirk Krolikowski (Rogers Stirk Harbour + Partners)

Seasons Through the Looking Glass
by CJ Lim

Agropolis
by mam

Alga(e)zebo
by mam

Chong Qing Nan Lu Towers
by mam

ProtoRobotic FOAMing
by mam, Grymsdyke Farm and REX|LAB

Banyoles Old Town Refurbishment
by Miàs Architects

Torre Baró Apartment Building
by Miàs Architects

Alzheimer’s Respite Centre
by Niall McLaughlin Architects

Bishop Edward King Chapel
by Niall McLaughlin Architects

Block N15 Façade, Olympic Village
by Niall McLaughlin Architects

Regeneration of Birzeit Historic Centre
by Palestine Regeneration Team

PerFORM
by Protoarchitecture Lab

55/02
by sixteen*(makers)

Envirographic and Techno Natures
by Smout Allen

Hydrological Infrastructures
by Smout Allen

Lunar Wood
by Smout Allen

Universal Tea Machine
by Smout Allen

British Exploratory Land Archive
by Smout Allen and Geoff Manaugh

101 Spinning Wardrobe
by Storp Weber Architects

Blind Spot House
by Storp Weber Architects

Green Belt Movement Teaching and Learning Pavilion
by Patrick Weber

Modulating Light and Views
by Patrick Weber