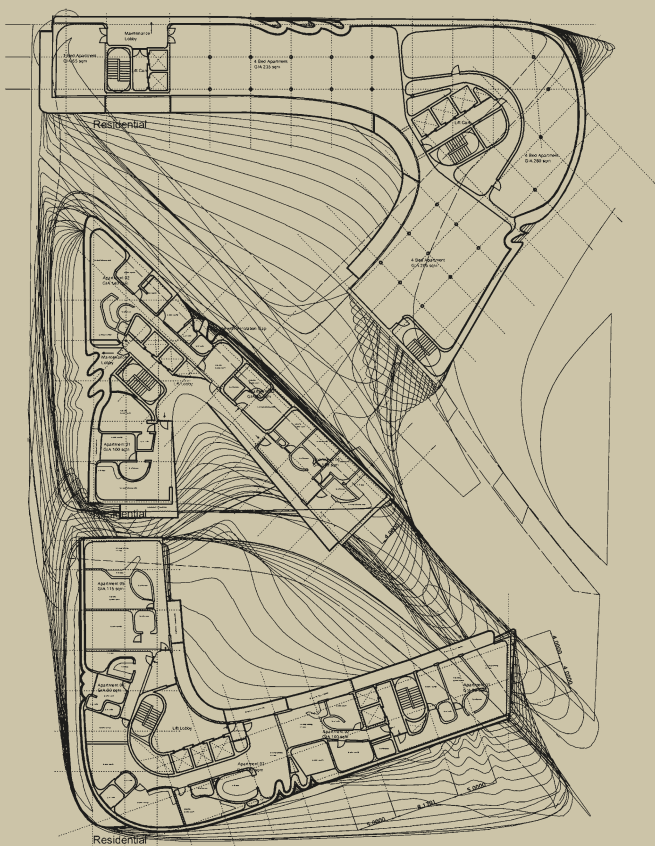


Chong Qing Nan Lu Towers



by mam

Project Details

Practice: mam

Designers: Marjan Colletti and Marcos Cruz

Colletti and Cruz contributed equally to this project through their collaborative practice, mam architects.

Title: Chong Qing Nan Lu Towers

Output type: Design

Function: Skyscraper incorporating residential, commercial, retail, hotel and cultural programmes

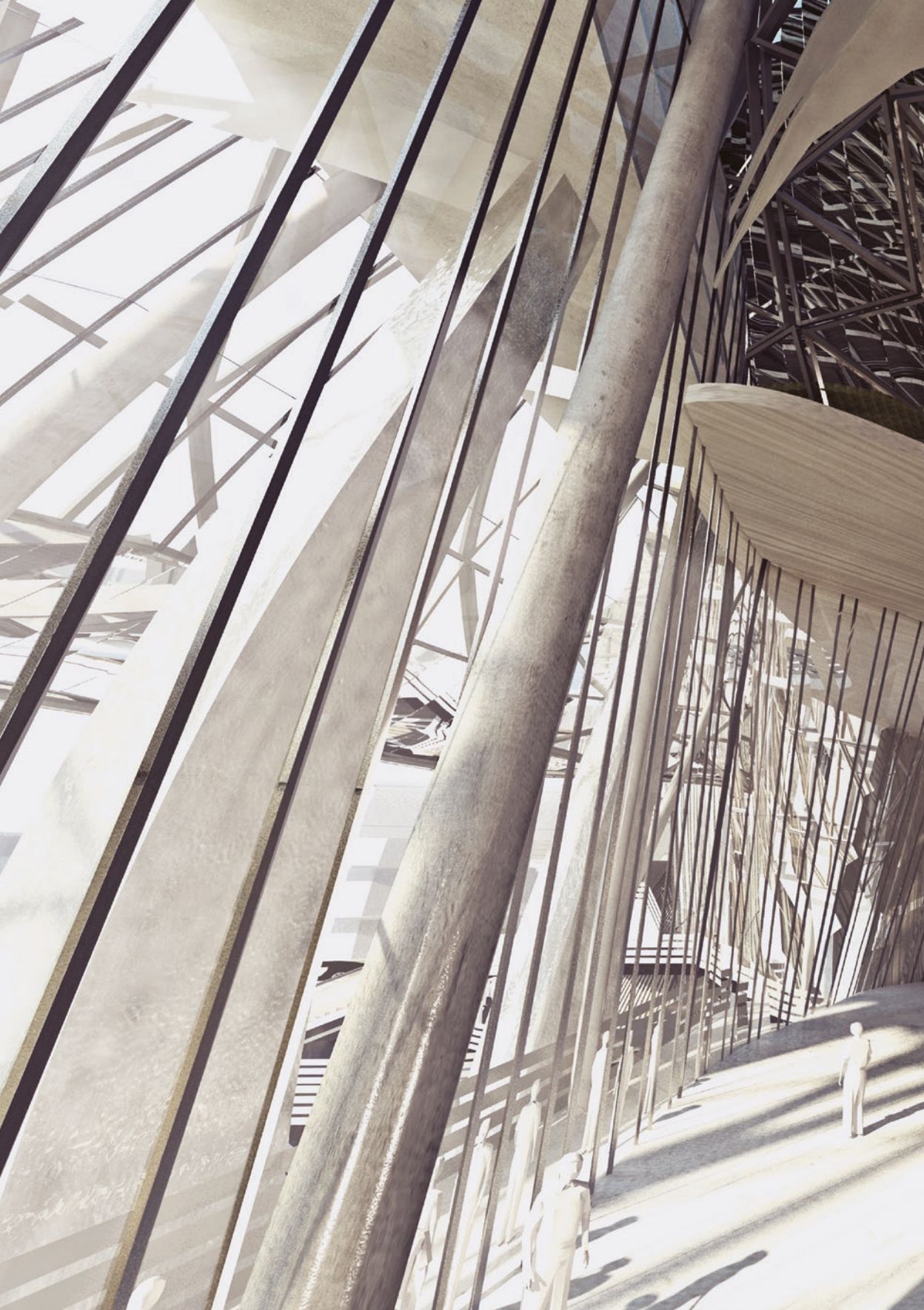
Location: 228 Peace Memorial Park, Zhongzheng, Taipei, Taiwan (Republic of China)

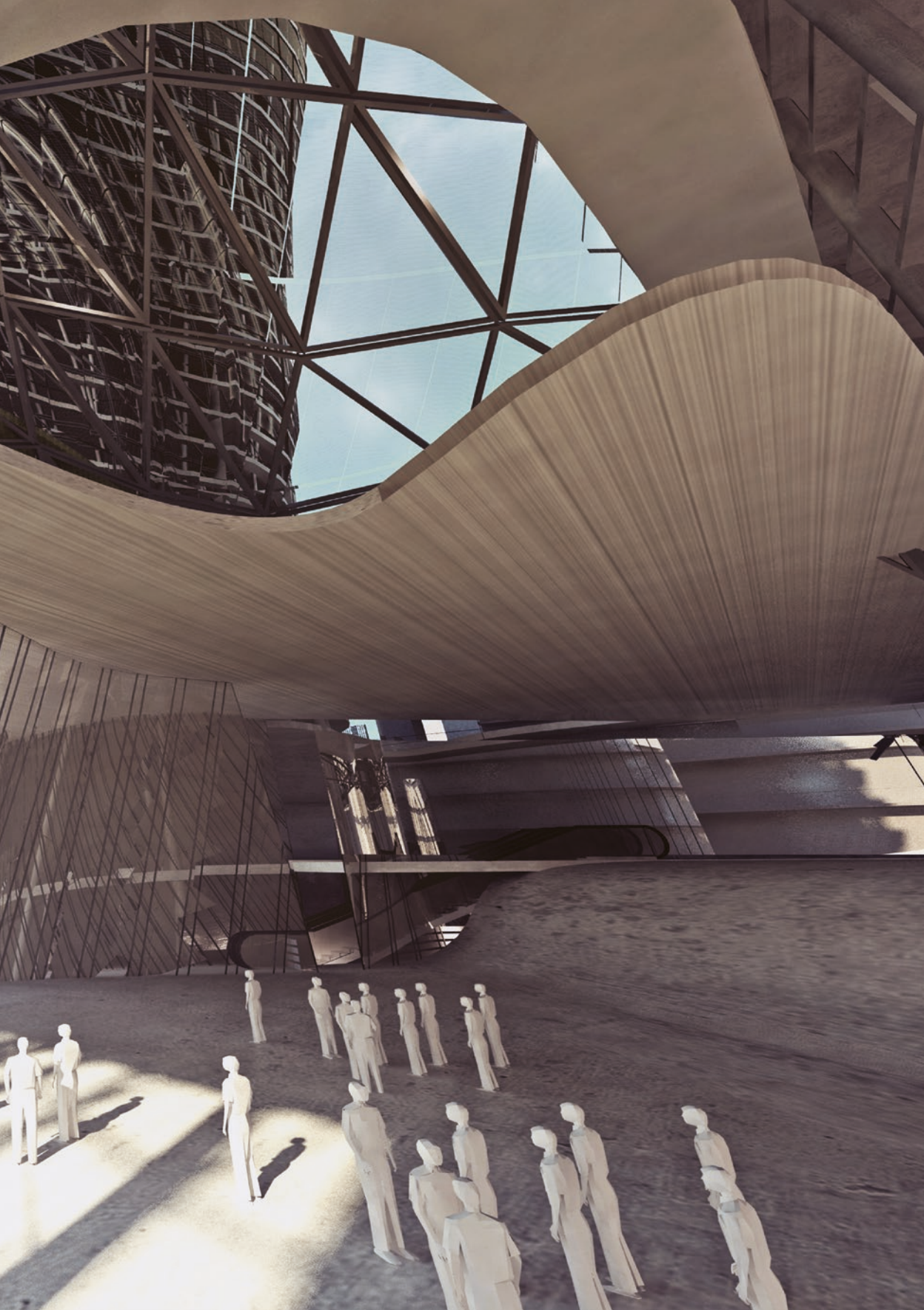
Client: Glory Yeh Art Park Ltd, Taiwan

Commission date: 2010; project currently on hold

Size: Three towers at a peak height of 157m with 35 floors and 7 floors of basement, 6,500m² footprint; total floor area 150,000m²

Collaborators: Ergin Birinci, David Edwards, Aleksa Rizova and Tze-Jun Wei





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.



2

2
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 Istanbul, 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]





4

3 & 4
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



6



7

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



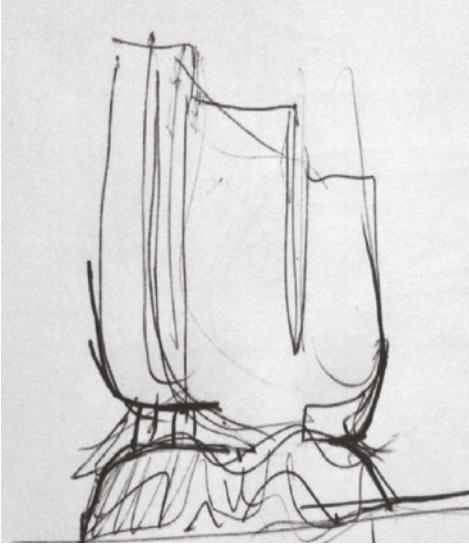


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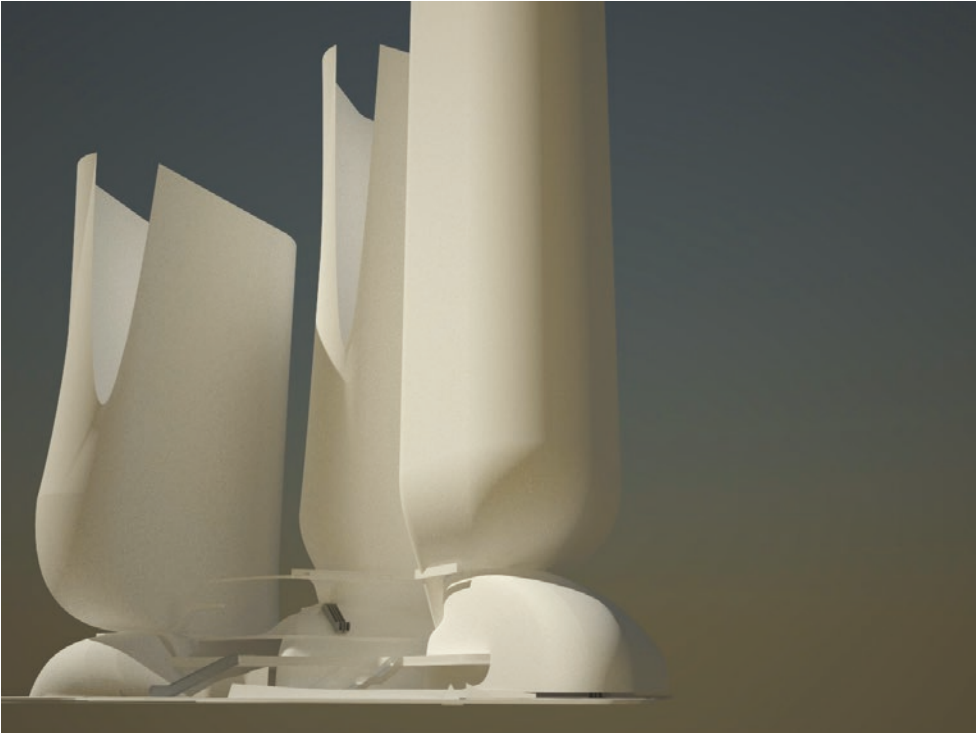


10

8–10
Taipei's low-rise
skyline compared with
Shanghai and Tokyo
Image in the public domain
via Creative Commons



11



12

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 creases, 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,

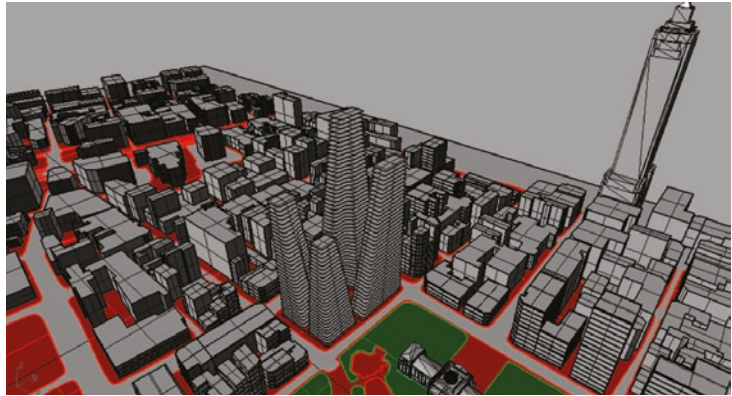
chiselled and sculpted to disrupt the mass and dissolving edges, and shaped to reflect the site's context, views and depth.

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.

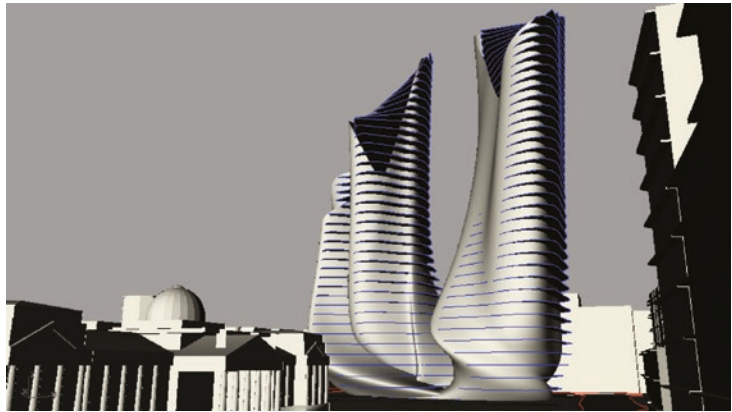
Multiple towers begin to interlock and overlap, allowing shifting views from the street and tower in chorus with one another. The proposal offers a range of faces according to perspective: elegant vertical pleats reinforce verticality from the rest of the city, and horizontal terraces face the public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

c. Programmatic organisation

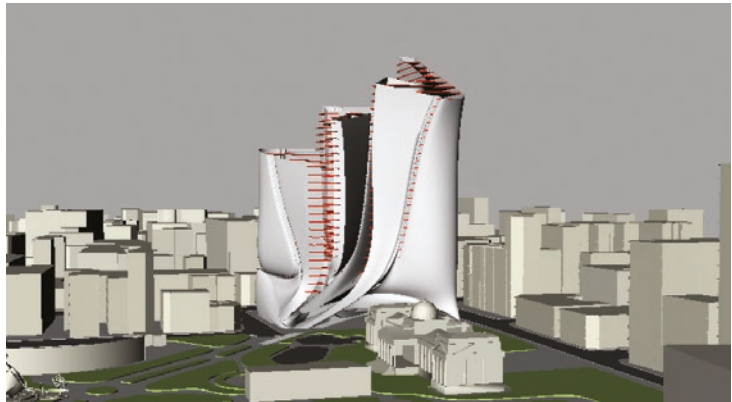
The proposal shifted dramatically over the course of two distinct methodological design phases. The first was a speculative vision, after invitation by the client. The second developed through this close consultative process whereby the research process shaped the programmatic brief in collaboration 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.



13



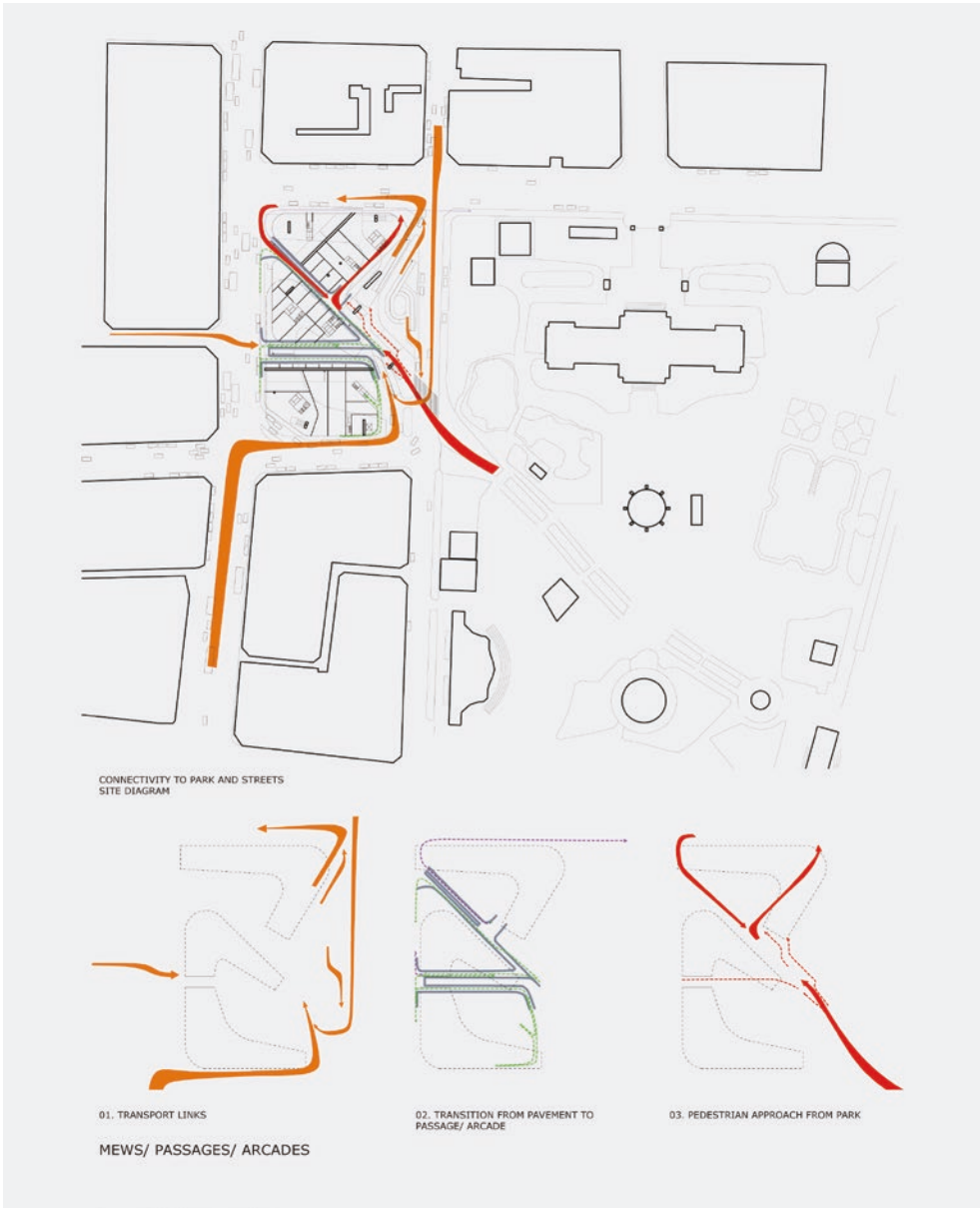
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15

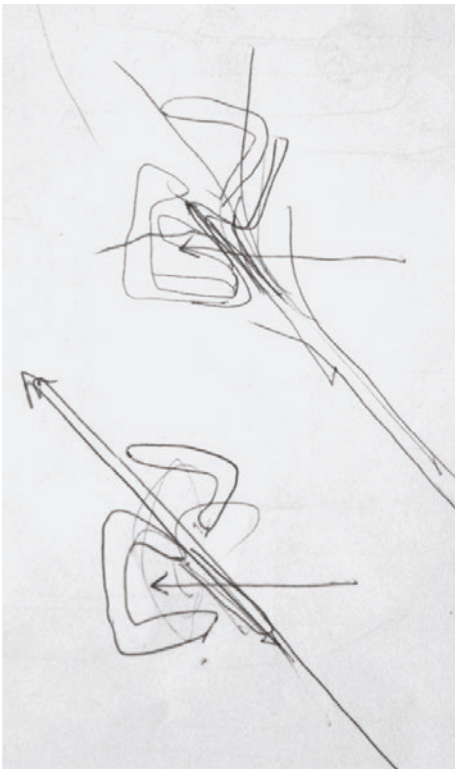
13-15
Massing studies using
perspectival views in
context, developing
from a single block
to pleated, twisting
multiple towers





17 & 18
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]

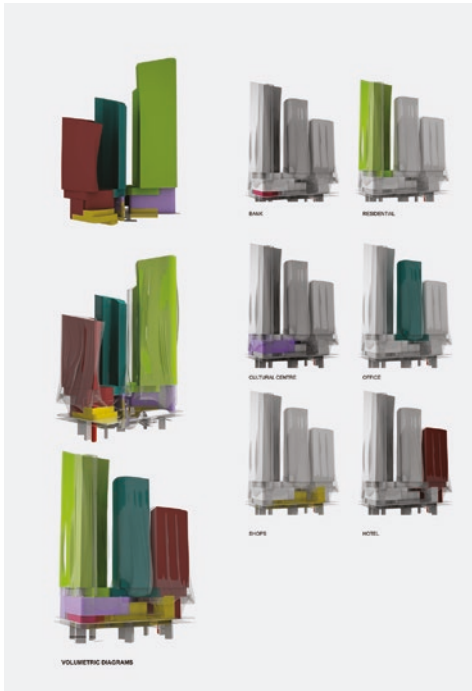


19
Contextual perspective
demonstrating how the
major diagonal axial

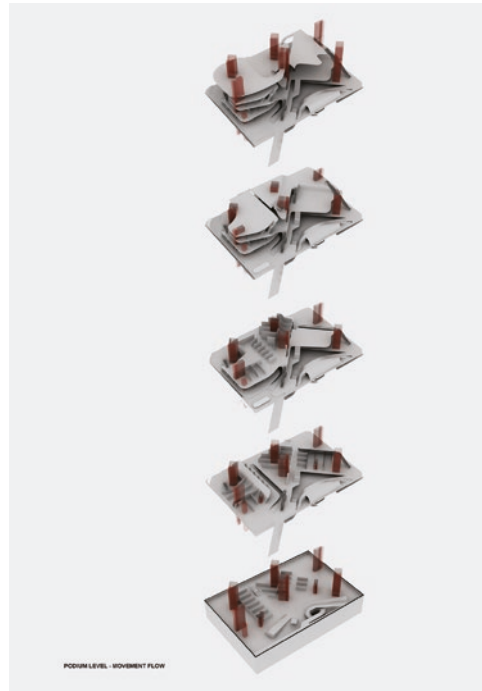
route through the
park is drawn into
the proposal

20
Perspective view
from the park

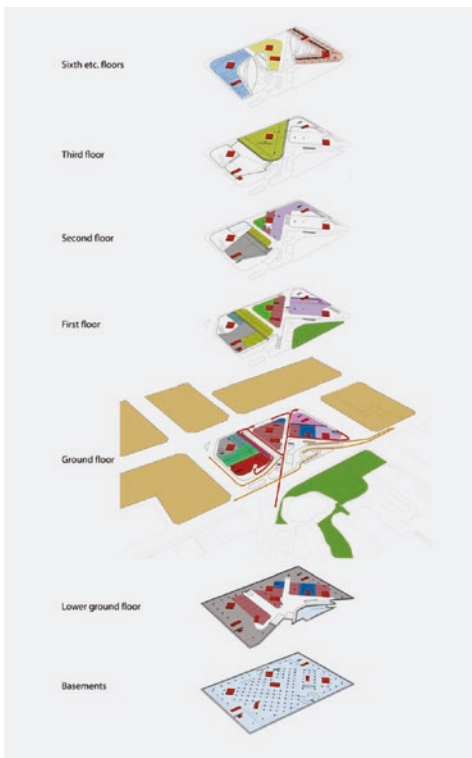




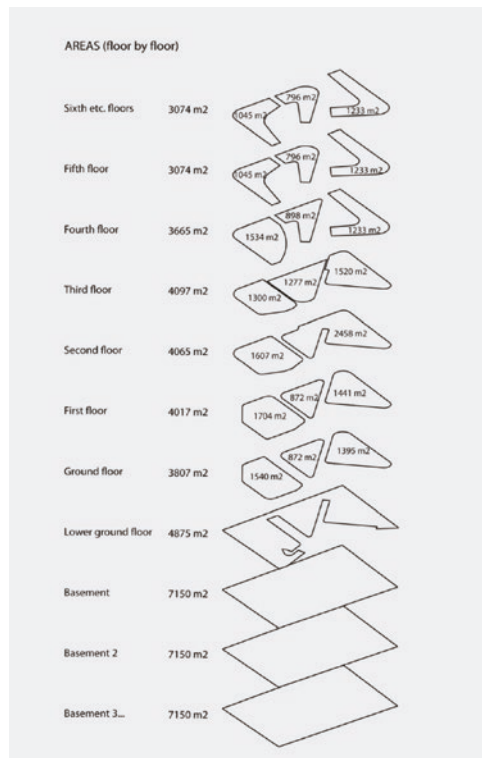
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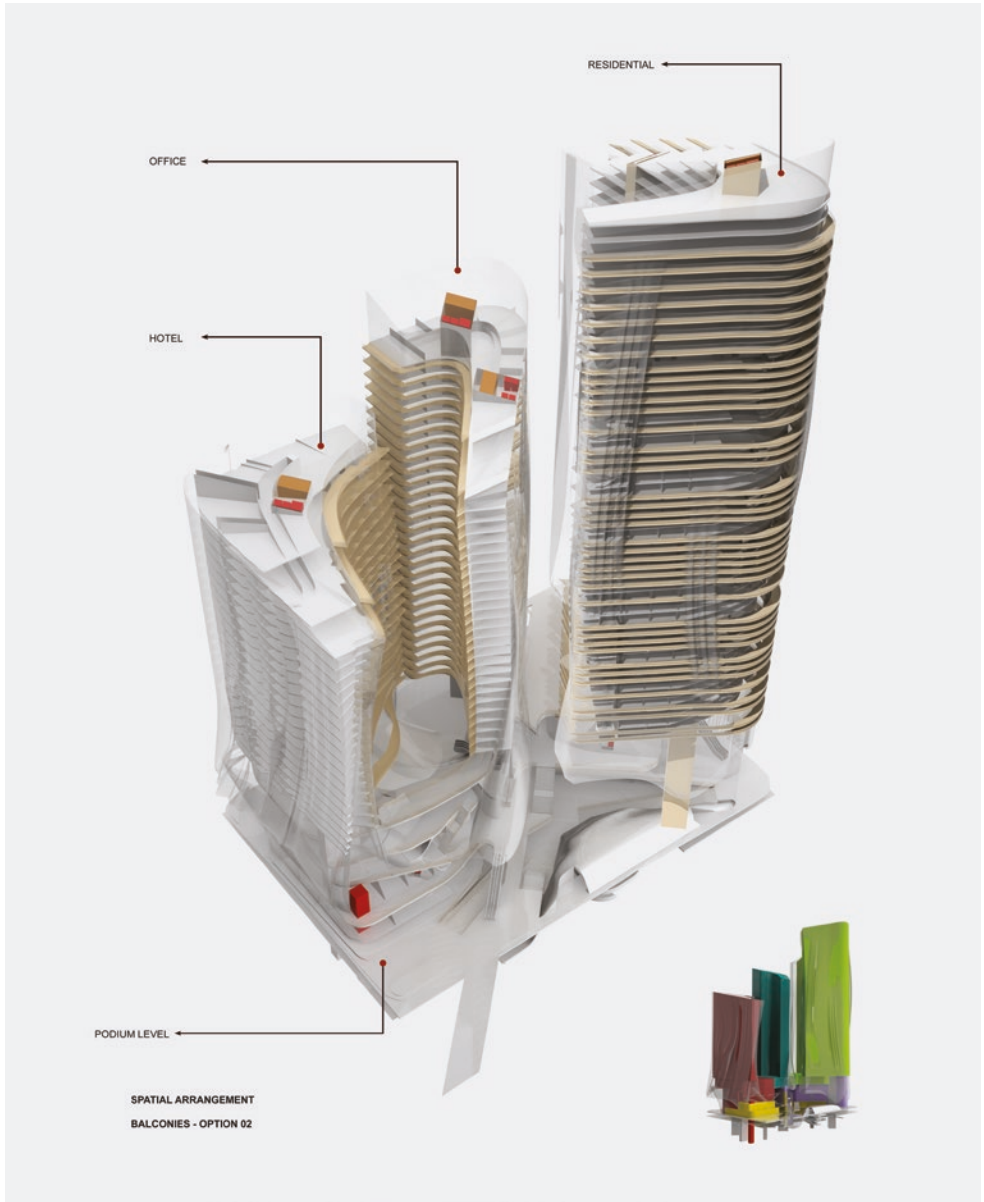
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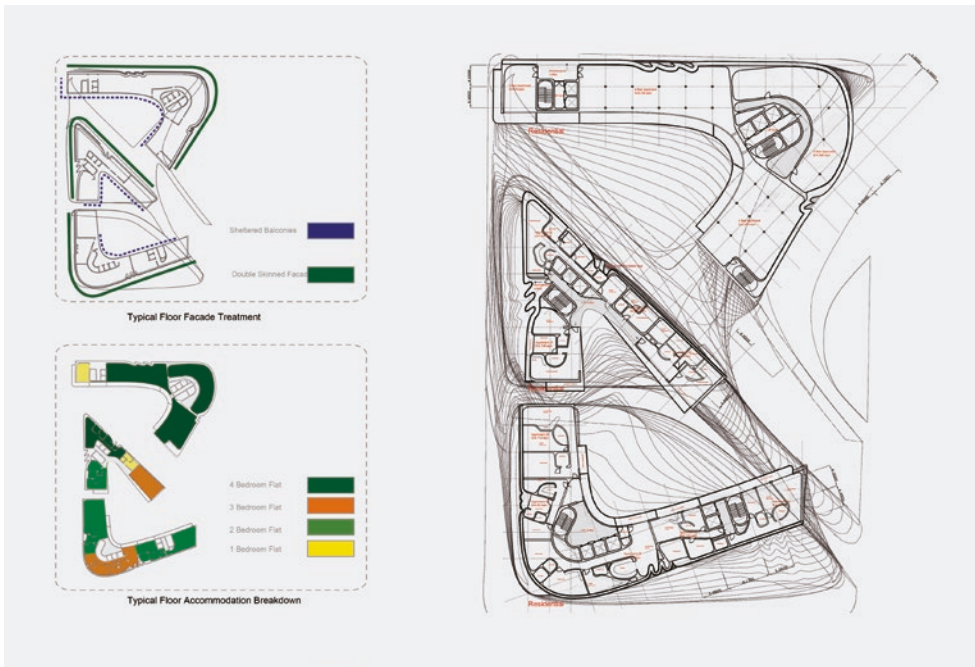
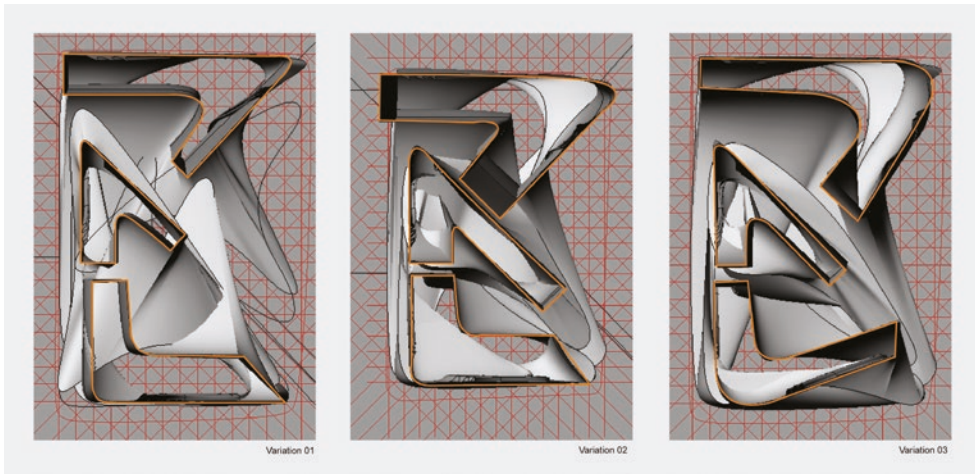


24



21-24
Floor by floor
programmatic
diagrams articulating
circulation patterns

25
Arrangement of
balconies within
residential units



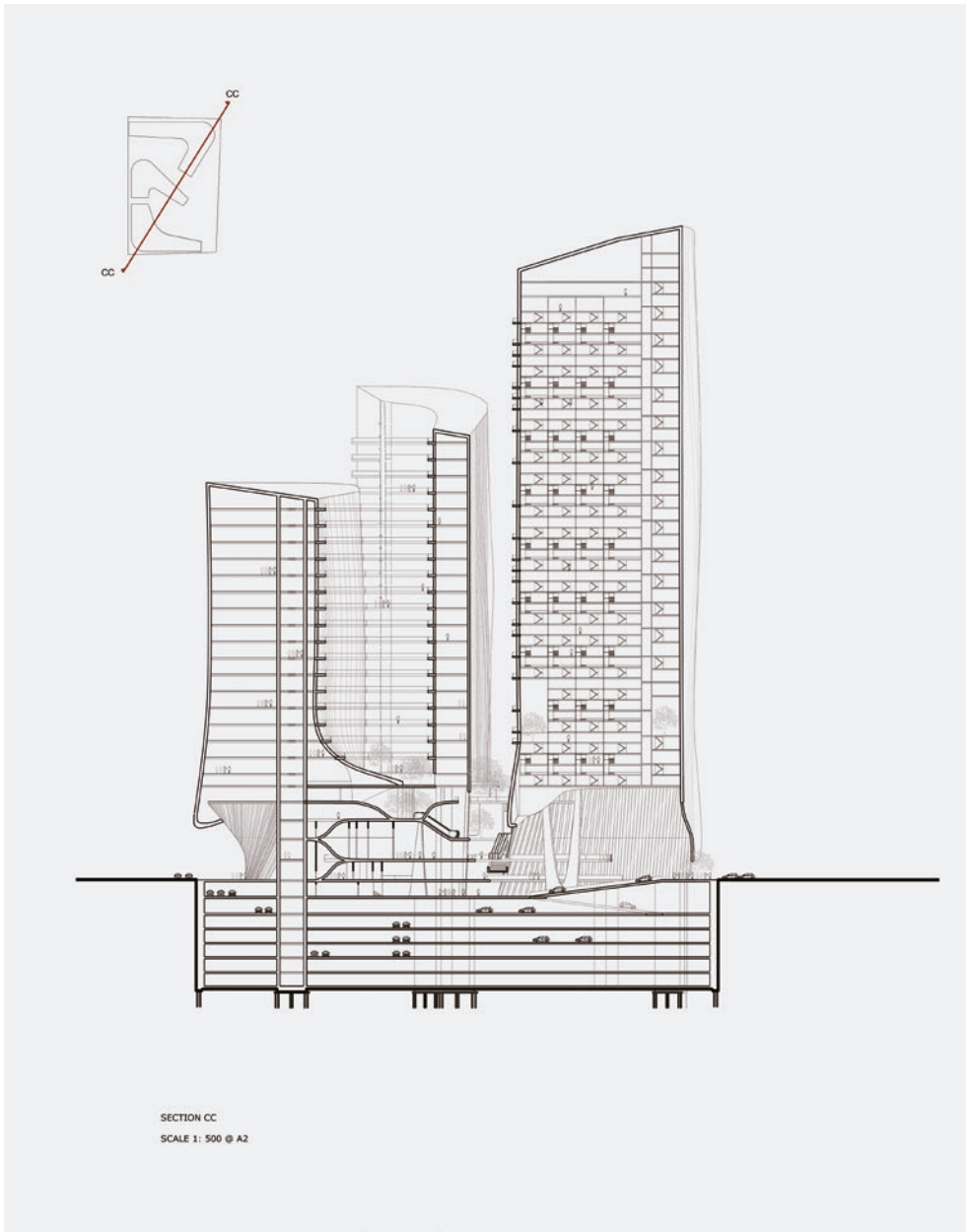
26 & 27
Development of
boomerang plan form
with façade treatment
and accommodation
breakdown

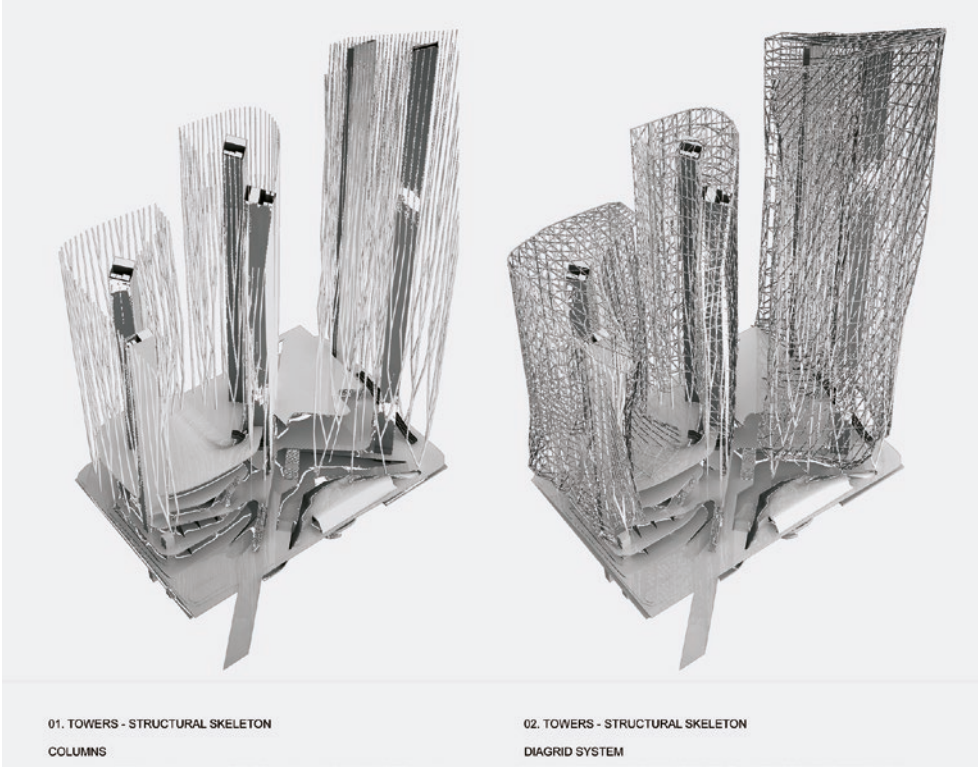
d. Design lexicon

'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.

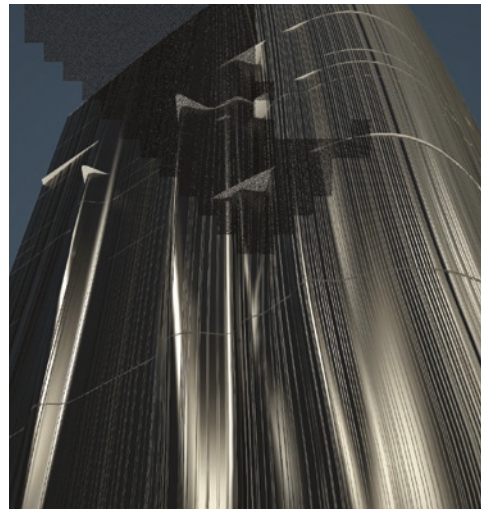
The structural development passed through two distinct stages. First, it articulated in a series of columns and cores based on a foundational structural grid, together with a lighter perimeter skeleton that forming the envelope. Key structural floors stiffened the whole, using cores and localised sheer 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 Gaudi's bourgeois housing schemes and the rhythm of the undulating, permeable 'gills' of Herzog and de Meuron's Hamburg Opera House. [fig. 26–36]



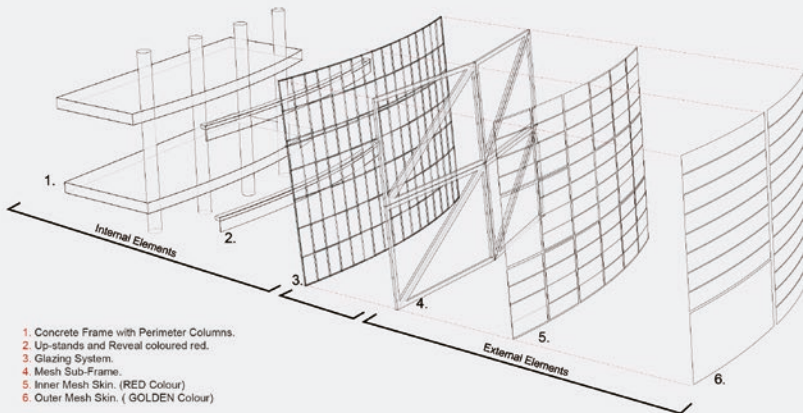
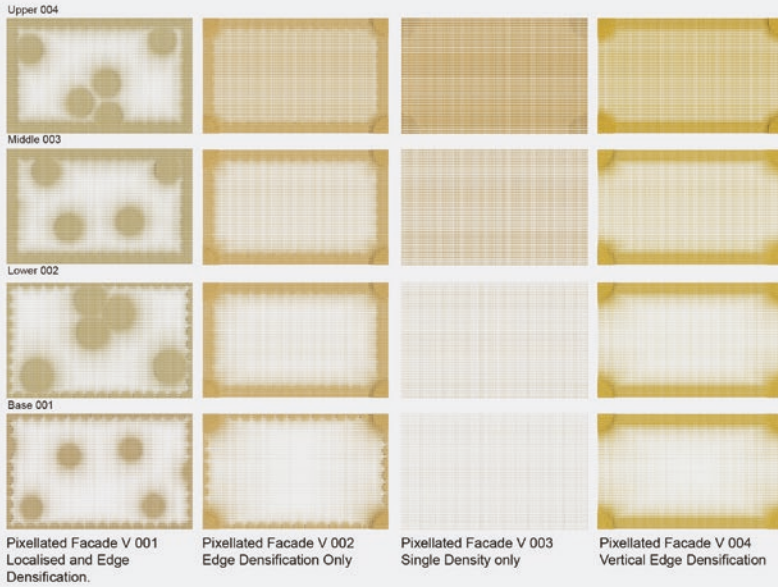


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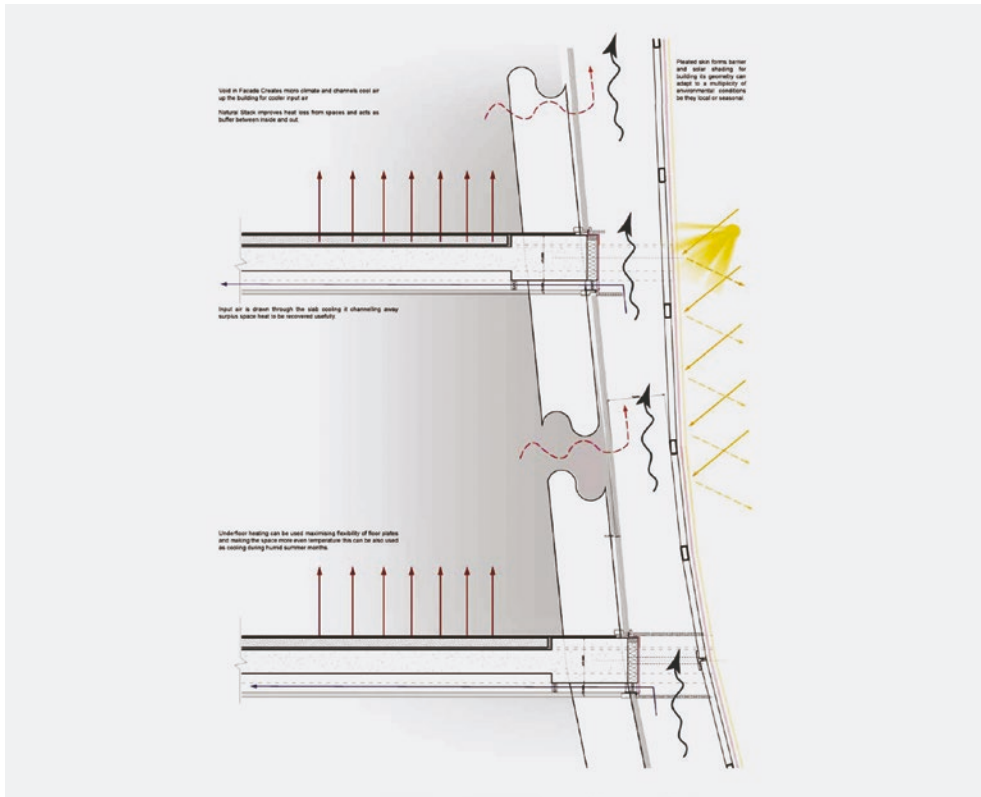


29-31
Perspective breakdown
of structure and
pleated skin

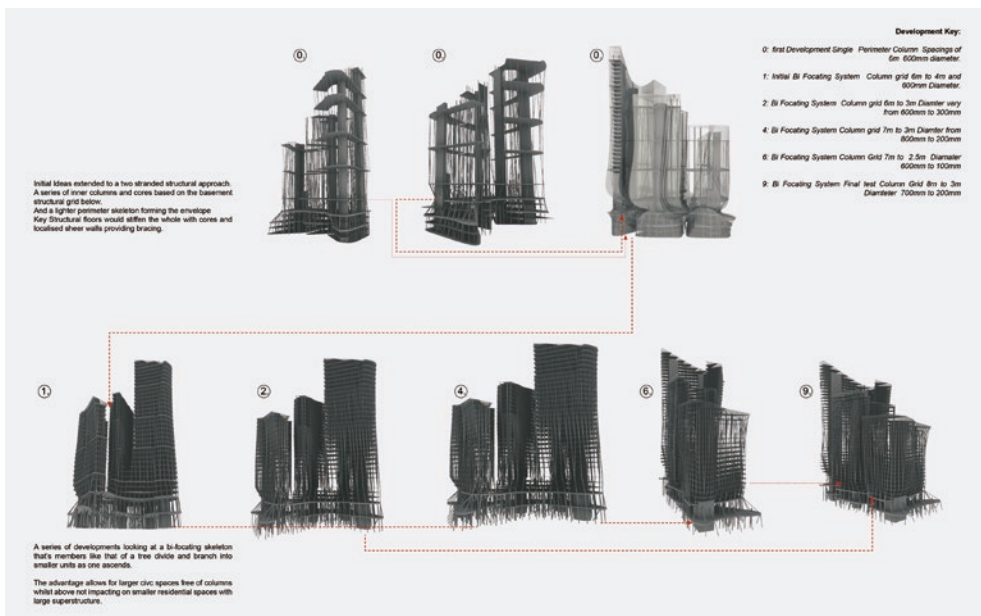
- 1. Base Level Panels Typical 75% Transparency
- 2. Lower Level Panels Typical 65% Transparency
- 3. Middle Level Typical 55% Transparency
- 4. Upper Levels Typical 50% Transparency



Facade Development



33

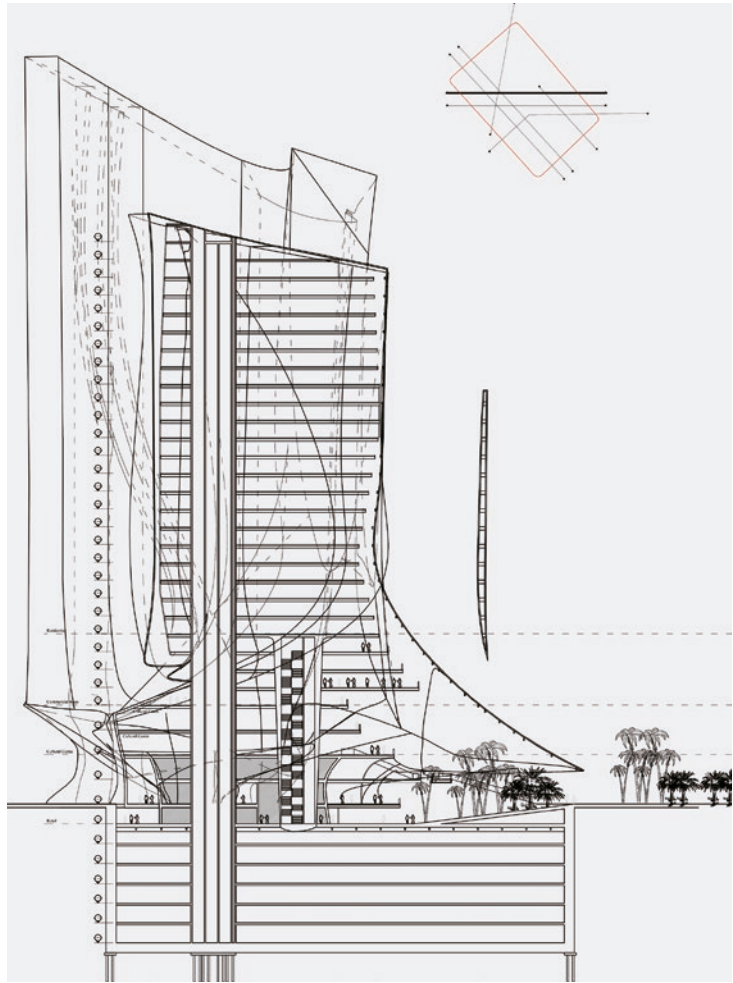


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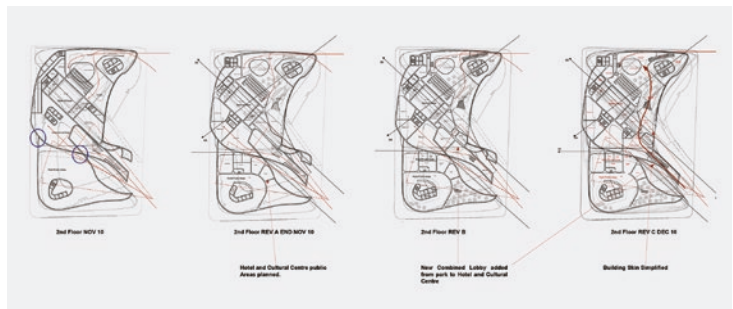




33–36
Development of
pixelated skin
with environmental
performance and
perimeter structural
detailing



37



38

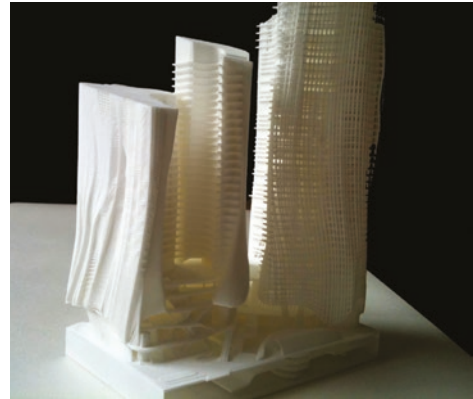
37 & 38
Elementary sketches
developing the
arcading between
object and podium,
extending into plan
and sectional studies

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.

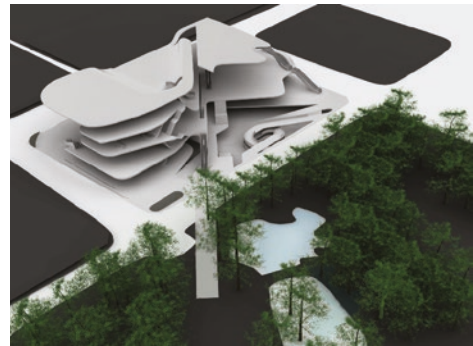
The public is invited into the envelope of the building through cantilevered arcades forged from overhanging towers which protect, but do not enclose, and reference the arcades that hold the city’s vibrancy, and enable small-scale, pedestrian and slow-paced movement. The retail units of the shopping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



39



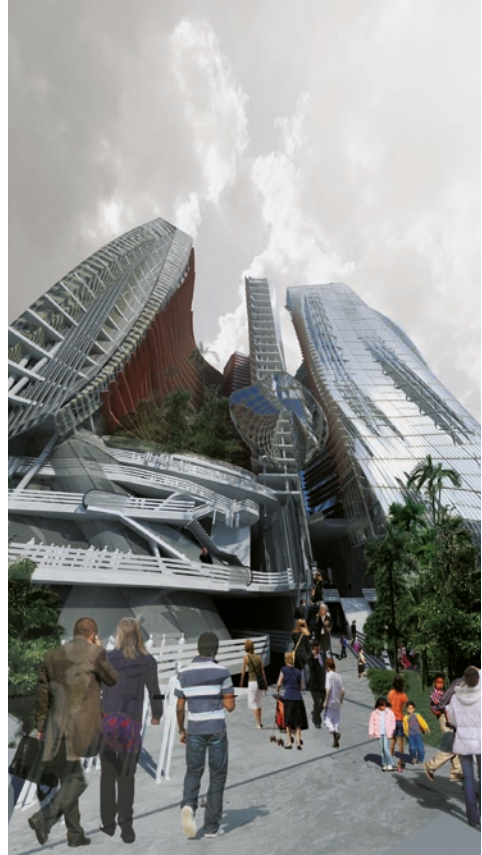
40

39
SLS printed model,
scale 1,000

40
Digital and SLS
printed model
showing podium
detailing



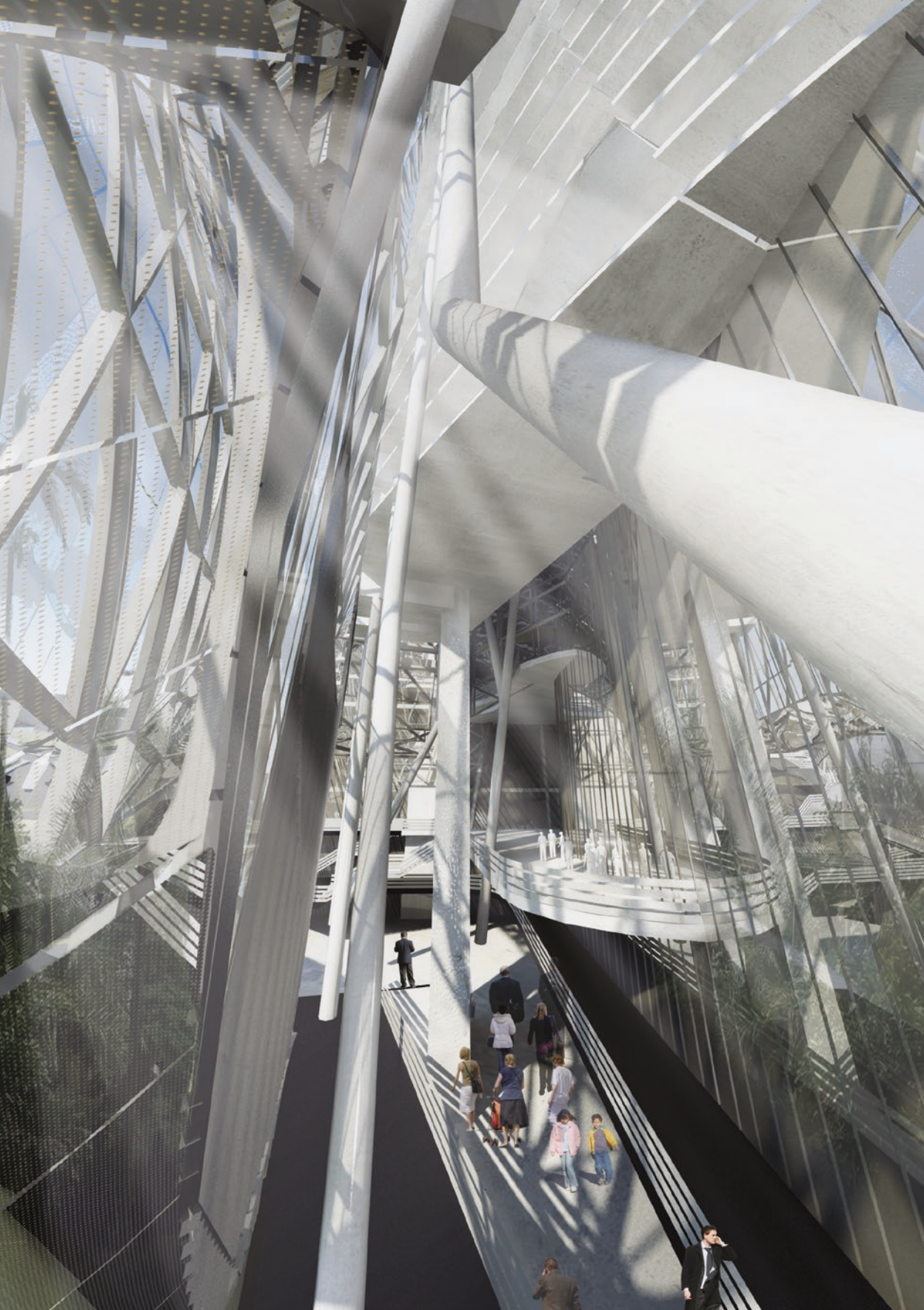
41



42

41 & 42
Perspective views
from park and
within proposal

43
Internal perspective
of cultural centre
atrium walkways



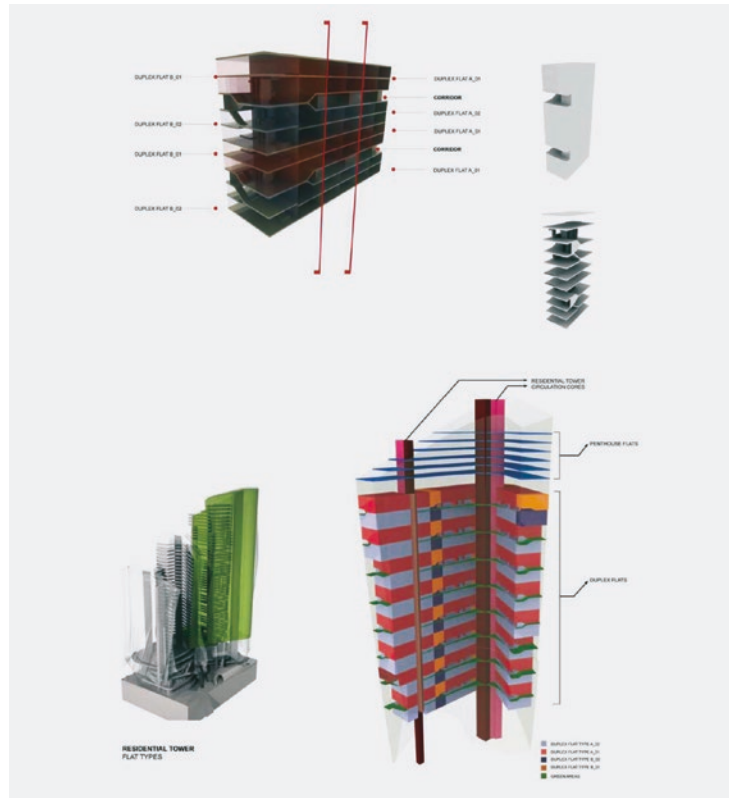


44
**Perspective of
internal atrium
of balconies**

45
**Perspective
demonstrating
horizontality of
podium extending**

**into external
balconies and
transparency of
rising floors**

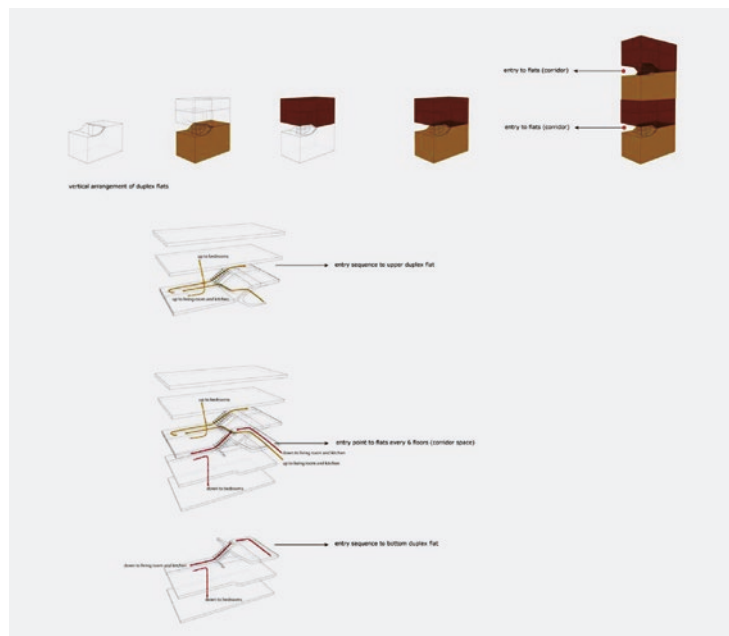




46

46
Arrangement of residential duplexes

47
Residential floor typologies



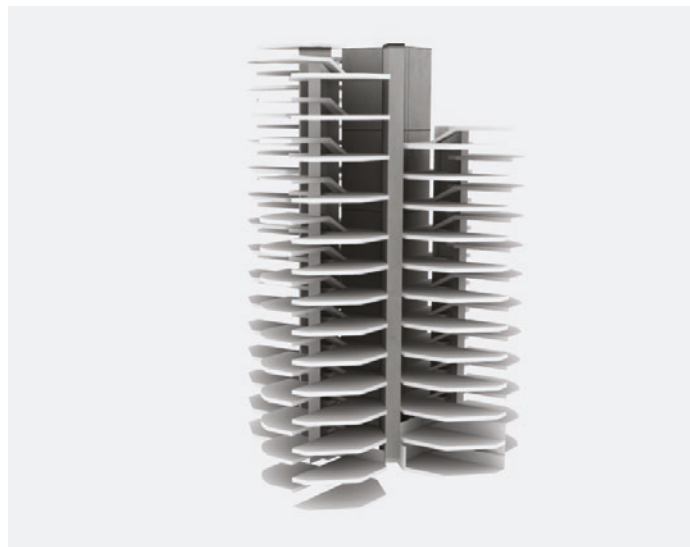
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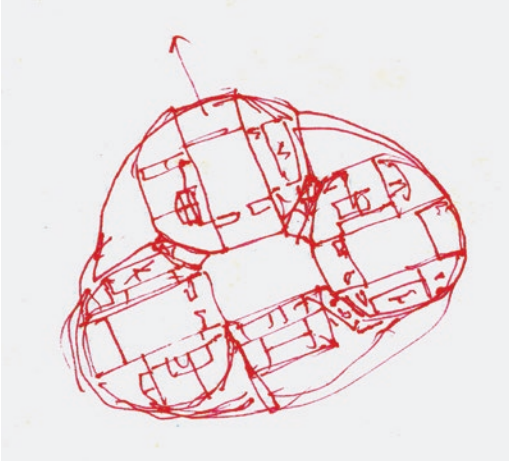
Residential typology: The project incorporates innovative residential typologies built on previous research into inhabitable interfaces, exploiting the opportunities of extending and occupying boundaries.

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]

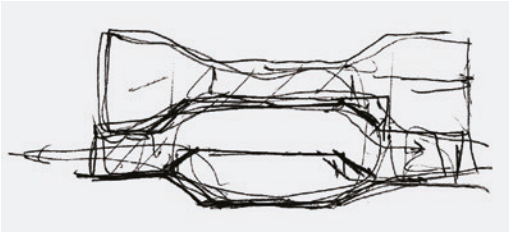


48 & 49
Typical residential
floor plans and
rectilinear apartment
3D views

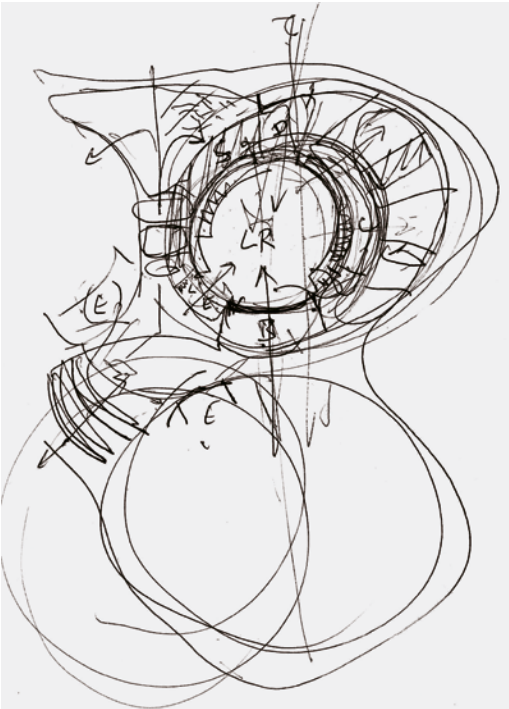




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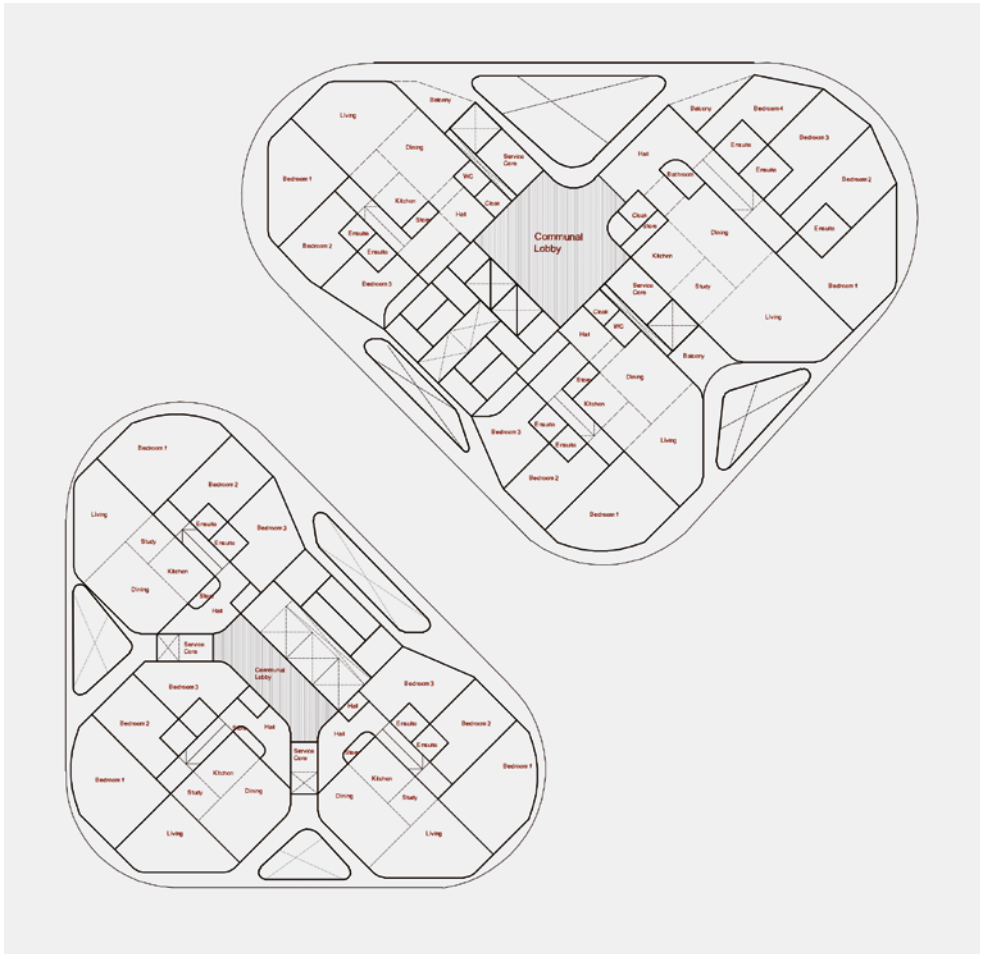


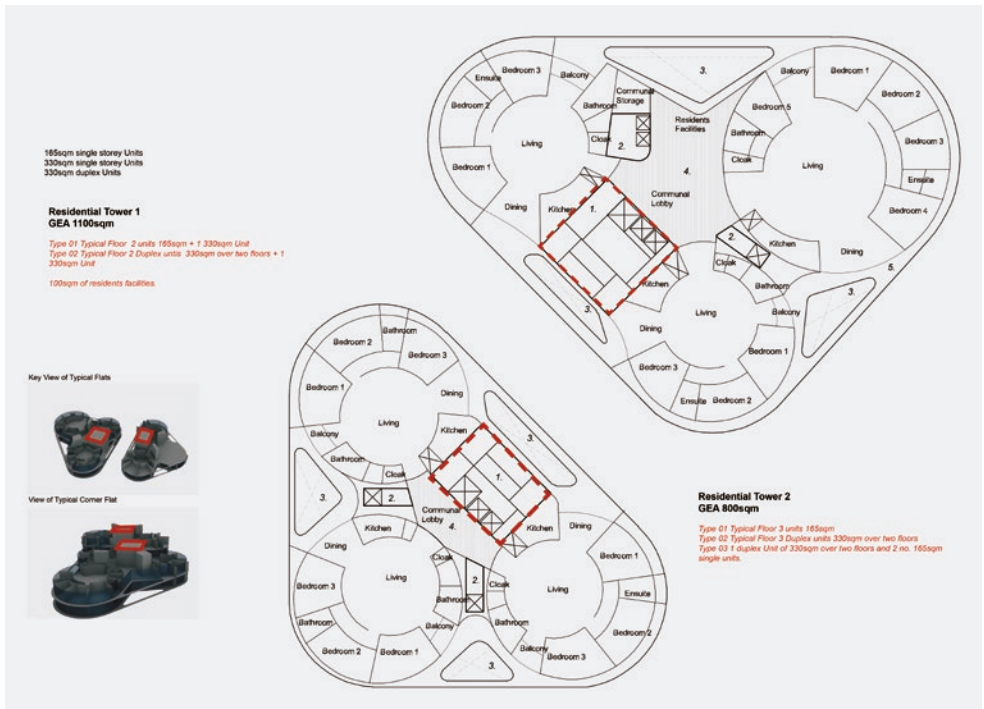
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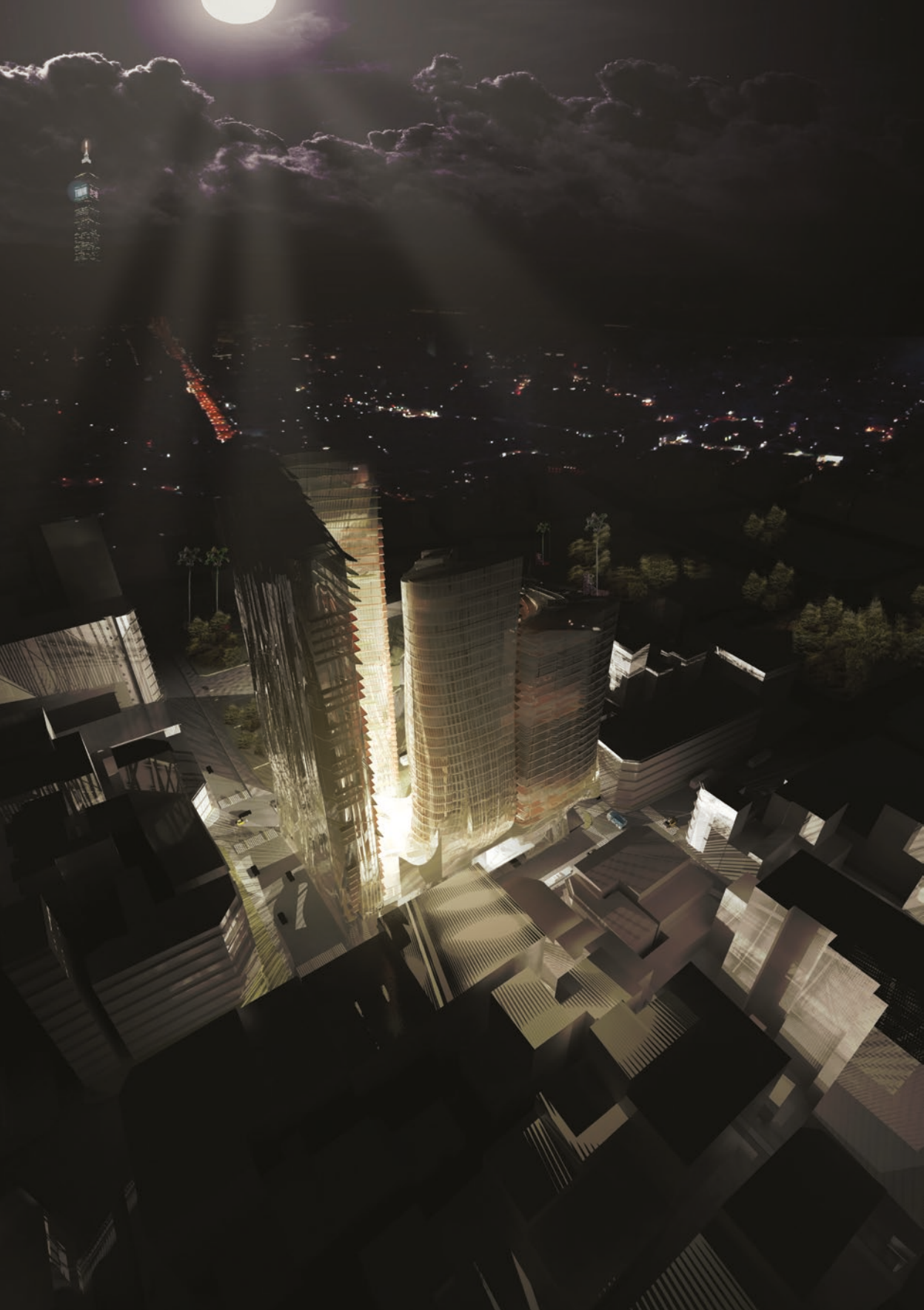


52

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)

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