HYPERDENSITY: REVIVAL OF SOCIAL FABRIC

by

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Abstract

In Hangzhou, building height restriction is employed to preserve views and historical values, this renders a comparatively low density in the city center. Unable to accommodate the pressure of rapid urbanization, much of the existing social and urban construct are continuously challenged and removed in order to embrace new profit-driven developments resulting in functional separation. This leads to a homogenized and highly commercialized yet low density fabric. The ambition is to revive the social construct by providing a new architectural language to intervene the many historic city centers where vertical expansion is not an option.

The thesis proposes a hyper-density approach to reconstruct the social program and integrate with the commercial fabric. Standard circulation of the street blocks and open space are strategically eliminated providing opportunity for insertion of civic programs. Oblique floor plates are introduced as an architectural terrain to operate and negotiate between two systems, the social and the commercial. With each system inherits its own set of distinct floor heights and programmatic parameters, discrepancies between 5 meters (commercial) and 3 meters (social fix) floor heights are identified as moments to privilege circulation, public space, daylight requirements or flexible social program (social flex). By privileging the social flex, the relationship between the social and commercial can be intensify in the form of boundary or diminish into an ambiguous topographic floor plate.

In this sense, hyper-density is fulfilled quantitatively by sets of floor plates delivering FAR counts and program units, as well as qualitatively by the construct of mixed-use and intensification of public access or ambiguous adjacencies. The thesis addresses the multiple implications of urbanization by re-conceptualizing the social programs and compacting the city center.
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The research will look specifically at the implications of density, rapid urbanization's implications on city centers, and newly emerged urban phenomenon of cities in China. The ambition of the research would be to observe and use the urban phenomenon of the Chinese cities as a set of framework or departure points for a hyperdensity architectural organization.
Prospect of China’s urban population

50% is living in cities in 2007,
75% will be living in cities in 2050.

Urban Age Project, The Endless City

China will approach 1 BILLION of urban population in next 20 years.

930,000,000 living in cities by 2030

The Chinese Dream
Shift from rural to urban

The Chinese cities have been in a process of accelerated transformation and (re)composition in the past three decades. Density plays a vital role in China’s shift from a mainly rural population to urban population and how the cities are mushrooming at an incredible rate. In 2007, more than 45% of the population (600 million people) was living in cities, compared with only 13.6% in 1954 (Rambert, 13). Nine-tenth of the population lives on one-sixth of the country territory. Nine-tenth of 1.3 billion lives on surface area only seventeen times that of France. (Mars, 111) Inevitably there is a shortage of arable land and the transformation has been mainly motivated by urban demographics that lead to a “hyper-speed urbanization” on an unseen scale. This process is further fueled by the exodus of rural population to urban centers seeking job opportunities and a better life. The cities react with open arms to the surplus of rural labors. The government has reacted with policies discouraging settlements in the megacities which are stimulating scattered low level developments know as “Policy Sprawl” of village and township urbanization at the city peripheral. According to Neville Mars, in 2020, both the peripheral urbanization and urban cores growth will coincide areas with density that forms continuous region which alludes to a “hyper-suburban road-dependent landscape” distinctly on one-third of the country. However, the limited surface will not sustain such hyper-suburban condition. Therefore, it is vital to stimulate a compact urban growth from urban cores to larger settlements. The continuous population growth necessitates compacting existing cities and hyper-density. Two types of urban growth can be observed. There is an individual and explosive growth of the small cities and villages located all over China. Simultaneously there is the clustering and study hybrid growth.
of mega-urban regions (megacities) such as the Yangtze River Delta, Pearl River Delta, Yellow River Delta and Jing Hu. With the Yangtze River Delta encompassing Shanghai-Hangzhou-Nanjing-Ningbo-Suzhou with estimated population of 87,430,000; Pearl River Delta of Hong Kong-Shenzhen-Zhuhai-Macau with 50,000,000 people, and along the Jing Hu railway corridor from Beijing to Tianjin with a population of 27,350,000³.

Need for compact city!

“If urbanization were to revolves around small cities which are least efficient footprint. The result will be an urbanity without the critical mass required to evolve into a system of compact mid-sized and large urban centers.” - Neville Mars

China has a floating population of 120 million.

In Shanghai alone, there is more than 3 million. Guangdong has 4.7 million.

Policy Sprawl

1. Semi-Urbanized Villages at urban fringe
2. Township-Village Enterprises
3. Upgrade (city building upwars and outwards)
4. Zone Fever, economic zone
5. Sub-centers

³ Currently, Beijing, Shanghai, and Guangzhou are existing megacities. They will emerge as new megacities while growing into and joining with surrounding cities. (wikipeida:megacity)
Numbers do not paint the whole picture

Floor Area Ratio | Person /sqkm | units/sqkm

Hutong
FAR: 0.52
Population Density: 29,000p/km²
Living space per capita: 9m²

Suburb Development
FAR: 2.81
Population Density: 21,000p/km²
Living space per capita: 27m²

Floating Village
FAR: 0.46
Population Density: 110,000p/km²
Living space per capita: 3m²

Hong Kong High Rise
FAR: 3.68
Population Density: 50,000p/km²
Living space per capita: 55m²
**Hyperdensity**

**Quantitative vs. Qualitative**

While the urban landscape urge a form of hyper-density, it is important to define what the term implies. Density is at the core of the transformation, it is both the catalyst for change and consequence. There are multiple ways to define density which could lend different parameters to characterize urban growth and architecture condition.

1: the quality or state of being dense
2: the quantity per unit volume, unit area, or unit length: as a: the mass of a substance per unit volume b: the distribution of a quantity (as mass, electricity, or energy) per unit usually of space (as length, area, or volume) c: the average number of individuals or units per space unit  
- population density of 500 per square mile
- housing density of 10 houses per acre

3: a: the degree of opacity of a translucent medium b: the common logarithm of the opacity

The first definition allows density to be an existing state, the catalyst. The definition of distribution of a quantity encompasses most of the quantitative aspects that are commonly used in the architecture discipline: density of population (people/km2), Floor area ration, and units/km2. Most of our understanding of density is through number representation and it becomes a numbers game easily. It might inform the F.A.R. or get translated into abstract datasets. But the numbers do little to describe the condition or quality of space. Questions as to whether an area feels vacant, neighborly, or cramped; even whether it feels dense or not dense are given little by the response through the figures. Traditional hutongs in the middle of Beijing tally a similar number of people per square kilometer as the suburban mega-development, and yet they are radically different environments. The Floor Area Ratio (FAR) of a communist dormitory block is close to that of a modern luxuries stacked villa – a typology built for the new economic elite. Evidently, the conventional density metrics is insufficient to inform the experience of space and density. Looking at density from a qualitative perspective is required to gain an authentic understanding of density and the potential of hyper-density.

Facing page

Images of Hutong, suburb development, floating population dormitory, high rise development. Credit: Neville Mars, Adrian Hornsby. The Chinese Dream.
What are the conventions for defining density?

Floor Area Ratio | Person /sqkm | units/sqkm

Density vs. housing units vs. space per capita
Alternate Interpretations of Density

According to Neville Mars's Perceived density, he addressed the soft information from experiencing is often more powerful than the underlying density numbers. Therefore, density perception, rather than relating to a formula, is contingent upon a number of environment factors, requires a holistic and intuitive approach. He proposes the perceived density diagram is a soft measure of density of a particular area.

It includes “five variables: the height of the surrounding buildings, the spacing between them with narrow spacing producing a higher perceived density); the footprint of the buildings (do they present massive objects on the ground?); the viewing scope to which residents have access (with shorter views producing higher perceived densities); and the amount of outdoor private space available to residents” (Mars, 653). While Mars perceived density diagram demonstrated qualities more relevant to the physical form of architecture and space, there are other qualitative parameters that could define other aspects of density. Functions derive density of programs; using the amount of varying programs as measurement. This brings out the distinct quality of uses. Density of events vertically, or density of events horizontally will present the degree of adjacency between programs.

Time can also be a parameter for density, density of time looks at temporal changes or the amount of activities taking place within a specific time frame. These qualitative parameters offer more possibilities for the second parameter which is “hyper”.
In his book, Hong Kong: culture and the politics of disappearance, Ackbar Abbas explained there could be two contrasting readings of hyper-density. One way is suggested by modernist ideas of town planning which “put the stress on a separation of functions, a segregation of commercial and residential spaces. But would separation lead to the mutual enhancement of these spaces, or to the creation of a boring homogeneity” (Abbas, 88). The other way is that of Hong Kong which consists of “aggressively mixing up the functions, of not rigidly separating public and private, commercial resident space. The result is heterogeneity, vitality, complexity. Hong Kong maybe the one of the few cities where one finds people in pajamas strolling in shopping malls (Abbas, 88). The inclination is toward the multiplication and concentration of different functions in the same space. “The construction of illegal and semi-legal structures: balconies, indoor gardens, additional storage space, and so on also transform the faces of anonymous apartment blocks by. The flat surfaces of these anonymous buildings were now covered in pleats or folds, multiplying in volume and interesting and providing a zone of mediation between inside and outside” (Abbas, 89). The argument takes on a positive reading of hyper-density of heterogeneity as it provides vitality and complexity necessary. This multiplication and diversity is necessary parameters for “hyper” to be in the state of extreme of high, rather than a linear extension of “high”.

To give hyper-density a more methodological understanding, in their book KM3, MVRDV proposed a theoretical city, the 3D City. The research embodies an urban theory which uses different parameters to define “3Dness”, as a result, formulating a new interpretation of hyper-density. The hyper-density is defined by parameters on a scale of 1 to 5 using Floor Area Ratio, Public Access, Programmatic Diversity and Programmatic Mix\(^1\). These parameters are combination of quantitative and qualitative measures which allow high-density to become hyper-density.

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\(^1\) The 3D Parameters use to define the 3D city by allowing projects to score on each of the parameters. The scores are divided into scale of 1 to 5 by using 20% steps: a maximum score of 5 is achieved by 80% to 100% or zero with complete absence of a parameter. (MVRDV, 500)
Implications of Rapid Urbanization

Along with hyper-density, an important issue essential to observe is the implications on city centers as a result of rapid urbanization: Population displacement, Housing Trends, Displacement of the Social Construct. These implications would inform potential programs and issues which can be address through architecture.
Implications and trends of housing

Access to housing in urban China

- Recent Urban Migrants: 25%
- Recent Rural Migrants: 20%
- Established Urban Migrants: 25%
- Urban Natives: 20%

Urban Natives

- collective living: 25%
- market rental: 20%
- public purchase: 3.8 sqm per capita

Rural Hukou

migrate

rural hukou
urban

Uncertain duration social disadvantage

Guangzhou Xian Beijing Nanjing Shanghai Chongqing Harbin Tiangjin Total

Collective Living
Others
Market Rental
Public Rental
Public Purchase
Economic Purchase
Market Purchase
Self-built

3.8 sqm per capita
The massive economy burst is continuously fueled by the displacement of a large population, the rural migrants. Waves of rural labors migrate east to urban centers such Shenzhen, Shanghai, Beijing, and Chongqing in north and south. Numbers can barely express the scale of the phenomenon, the department that manages the Hukou, the residence certificates that strictly controlled all mobility, is finding it hard to keep pace. Today, the “floating population” that moves between city and countryside is estimated between 150 million to 200 million (Haski, 122). Due to their rural hukou, the floating population is excluded from urban rights in cities, subsidized public housing. As a result, they have to turn to private markets, which are often too expensive. Non-hukou migrants often renting beds or extremely confined spaces that are shared with a group of people to reduce rent. This is a rather pervasive housing condition called group renting. The group renting is illegal and usually one apartment is subdivided into 20 individual rooms by wood planks. The density of such living condition reaches a state of hyper-density. This group of floating population has minimal needs of space and rent charges. Their sheer population calls for a dedicated type of housing investigation as they currently represent approximately 25% of housing in urban China.

1 Hukou: local residency license or permit based on an individual's household residence, also called household registration. Holders of the appropriate hukou are able to access local services and social welfare. Hukou is geographically specific, it is necessary to remain within the boundary defined by the hukou or obtains a hukou transfer. (Hornsby, 680)
Adjacency (Gated Community)

Rapid urbanization has casted physical transformation in cities. This physical implication is both a form of removal and a form of addition fortification. Much of the vernacular architecture, the gray brick and mortar walls, so distinctly Chinese are being demolished. Of the 7000 hutongs of 1949 Beijing, only 137 remain. The unremitting thrust of modernization and urban expansion has overhauled the old and replaced it with the new in most Chinese cities. This aligns with the government’s objective provide the foundations for modern lifestyle, and offers the opportunity to become rich and independent. However, at the same pace at which the walls of ancient China crumble, new gates and fences are erected. Luxurious residential areas as gated communities are erected all over the country. In his book the Chinese Dreams, Mars gives the analogy of “the enclave should be understood as the typological success formula of market-controlled urbanization; most notably in areas of rapid growth. The public domain is reduced to controlled commercial environments; spaces in between the enclaves are relegated to the status of leftovers” (Mars, 187). The initial prototype for the Chinese gated community was the compact tower. They are packs of secluded towers of extreme density. The public roads around these gated communities become increasingly inaccessible and of desperately poor quality as the communal space are at risk of effacing from the urban fabric. The segregation of program is not sustainable for cities. New form of adjacency must be established with other public programs to regenerate the public domain. The gated secure aspect could be express through a hierarchy of public to semi-public circulation instead of physical walls and security guards. Hyperdensity’s multiplication of functions is precisely needed to break the wall and the adjacency could define a new form of security and “gate”.

Facing page

Left
Images of gated community. Credit: Neville Mars, Adrian Hornsby. The Chinese Dream.

1 (Hornsby, 187).
Displacement of the Social Construct

 Millions of people were displaced in the city centers to make way for the gigantic urban renovation projects. The displacements are then discarded on the outskirt of towns. When you wake up in the morning with the character “for demolition” painted on your house, you have one month to reorganize your life. Families are often displaced a normal 15km outside city center (Haski, 126). This has happened to millions of people in most big cities. As cities continue to grow, it is inevitable that old has to make way for new buildings, and less profitable structure has to make way for lucrative developments. Having old housing demolish always being the case, there should be a realization that the government cannot continue to relocate people to the city periphery. Perhaps hyper-density could be investigated to create the possibility of new adjacency that could allow the population to be relocated at the same site and retain the social construct.

From the observed implications, socially and physically, different elements and issues can be used as the framework to inform the specificity of social programs and density, as well as the adjacency with commercial programs. There is a population density to meet, mixed-use programs to connect, walls to be break and reinstated differently.

Facing page

Images showing the process of the removal of housing and the people who are being affected. Left showing the word “demolish” spray painted on building. Center showing housing fabric being demolish in city. Credit: Mathieu Borysevicz, Learning from Hangzhou.

Left

New housing development on the outskirt of city. Credit: Mathieu Borysevicz, Learning from Hangzhou.
Hangzhou

Hangzhou is one of the most scenic cities and is one of the seven ancient capitals of China. It is home to the West Lake whose scenery inspired various classical poets and is one of the most popular tourist destinations. Under the wave of rapid urbanization in China, Hangzhou is also the 7th fastest growing city.

It is the capital city of Zhejiang Province with a population of 6.77 million. About 70% of the population live in city and 30% in peripheral villages. The city has great potential of rural to urban migration with the existing 30% village dwellers and from neighbor provinces.

Tourism

Hangzhou is ranked 7th the most popular tourist destination in China
Over 60 cultural relic sites of state, provincial and municipal levels
32 million tourists (2 million international) annually
Tertiary Industry 5% of the city’s GDP
Facing page
Picture of places to come. Credit: Mathieu Borysevicz, Learning from Hangzhou.

Left
Hanging as architecture. The common habit of drying clothes on the street in local neighborhood. Credit: Mathieu Borysevicz, Learning from Hangzhou.

Right
Postmodern Westernism. One of the many stylized Western classical style. Credit: Mathieu Borysevicz, Learning from Hangzhou.
Urban Growth

Due to the historic center, height restriction keeps the density in city center rather low. Being under both the development and preservation pressures, Hangzhou has been expanding outward in a polycentric manner of subcenters with an area of low density core due to its proximity to a heritage site, the West Lake. This urban core offers an opportunity for hyper-density to accommodate the diverse programmatic demand of housing, mix-used, and tourism.
Site

The site is situated in the historic and contemporary city center of Hangzhou, China. It is located less than half a kilometer, about 5 minutes walking distance from the West Lake. As a former site for the Zhejiang University School of Medicine, it had served as an education center for the past decades, surrounded by multiple primary and secondary schools in the area. With the West Lake to the west and a busy commercial strip on the adjacent east, housing and historical fabric on the north and south axis, the site sits within a rich urban fabric. The city of Hangzhou is currently implementing a subway system and a major underground artery is being constructed on Yang An road to the east of the site, intensify the density and activities in the area. However, this hybrid condition has been gradually effaced and soon transform into a monocultural commercial fabric.

Top
Map of greater Hangzhou area. Source: Google Earth Image

Below
Map showing locations of education facilities and site
Height Restriction
While the building height restriction in the surrounding area ranges from 18m to 80m, the proximity to the West Lake placed the site under a 25 meters height restriction zone.
CITY ZONING: zonig code in relation to the lake
Above
Diagram showing site context: grain of buildings' elevation / FAR / building height.

Facing Page Top
Site Photo, Yang An Road on the east.

Facing Page Center
Site photo, looking towards northwest.

Facing Page Bottom
Site photo, looking towards southwest.
Facing Page Top
Adjacent Yang An Road lined with commercial and bank buildings on the east.

Top Right
Hangzhou No. 14 Middle School north of the site. Credit: Wang Yuan Bin.

Bottom Right
Subway construction on Yang An road with the site visible on the left. Credit: Wang Yuan Bin.

Facing Page Bottom
Intersection southeast to the site

Left
Adjacent intimate scale residential neighborhood on the west.
**Zoning Diagram**

2010

2017

*Removal of Social Construct*

As mentioned in the implications of urbanization, housing and civic programs are often the first to be demolished to make way for new commercial development in the benefit of economic expansion. The above zoning diagrams present a gripping condition of this trend surrounding the site area. Much of the residential zones are covert to mixed-use with commercial functions. Education buildings and affordable guest houses are also decreased to allow an increase commercial land usage. Health facilities remain untouched in this phase of development. One can observe the greenery locations have been slightly adjusted, however still remain sparse and without a concept of public space in general.

The zoning plans for present and future inform the premise of the thesis of constructing a new type of social fabric within the growing commercial framework.

*Right & Facing Page*

*Image of housing demolition & thriving commercial malls.*

*Credit: Mathieu Borysevicz, Learning from Hangzhou.*
Building Orientation Studies + Housing FAR Studies

4 storey
60800sqm
FAR 1.25
31.4%

6 storey
72960sqm
FAR 1.5
25%

10 storey
91200sqm
FAR 1.88
18.8%

4 storey
67453sqm
FAR 1.139
34.8%

6 storey
82664sqm
FAR 1.7
28.4%

10 storey
96310sqm
FAR 1.98
19.89%

FARMAX: density studies on site

Building Orientation Studies + Housing FAR Studies
Density Studies
This is a series of studies testing for the quantitative aspect: FAR in relation to building height and orientation. Building orientation is an important parameter for testing as the angle from south changes, the distance required for daylight between buildings varies. This allows a range of densities on site while they all fulfill daylight requirements. The tilted angles range from 0 to 40 degree. Orienting 15 to 30 degree to the south proves to achieve the highest density while maintaining daylight requirements.

Building code setback in relation to surrounding buildings and streets forms the final building footprint.

Basic Commercial and Housing Blocks Hybrid
**Differential Density**

This series of study has two folds. One is to present the different frequencies in which densification could occur. Uniform density allows maximum FAR and minimum specificities. Distributed density allows a diverse mixed of spaces and specificities throughout the site. The notion of oblique is introduced to connect moments when the density of floor plates varies. Differential density implicates zoning and provides densification according to distinct program parameters.

The second fold is to observe the drastic reduction in FAR when basic programmatic requirements are introduced. Ceiling height clearance, daylight and public space are essential parameters which will greatly influence quantitative density.

10 storey
484000sqm
FAR 10
100%

10 storey
489590 sqm
FAR 10.12
100%

10 storey
497204qm
FAR 10.27
100%

building density 100%

introduce specificities
distributed density
introduce program parameter with zoning, daylight requirements

differential density
**Splicing as Tool for Program Differentiation and Daylight**

*Splitting and Slicing*

Taking the building footprint and responding to the site context of surrounding building height results in a low rise massing thickening towards the east commercial strip. The building is spliced and split twice allowing the two ends of the building to open up and gradually align and reconnect towards center. This allow programmatic separation and daylight penetration on the east and west sides, yet retaining a center core to accommodate large and highly public functions where maximum adjacencies between programs can occur. The method of splicing required specific studies to explore the architectural opportunities such as courtyards and circulations.
Horizontality & Continuous Surface
There is a paradigm shift to horizontality as expanding in the vertical axis no longer sufficed as a solution to density as intricate layers of urban issues such as height restriction and social programs come into view. This study looks at the possibilities of the floor plate as a malleable construct engulfing distinct programs. The floorplate could be used to connect or to alienate programs.

01 horizontality

02 varied program height & specificity

03 malleable floor plates to contain necessary programs with extra room to share
Continuous Surface ... models

The thickened floor plates are used to represent the dense floor height and programmatic spaces, allowing a registration of floor to floor partition and expression of voids (large public space) and courtyards within the dense volume.
Continuous Surface... models
Here the floor height is exaggerated to display the topographic potential of the continuous surface. Floor plates could merge into and split from one another. Courtyards are penetrated by housing slabs facing south.
CONNECTIVE TISSUE: ambiguous grounds
Oblique floor plate is initially explored for its potential for topographic order and continuous floor plate integrating circulation with various program ceiling heights. The exploration has delivered multitude possibilities and in turn became the architectural language deployed in this thesis. The oblique performs as a flexible organizational framework to generate density, social programs and the connections between programs.
SHAPE GRAMMAR STUDIES: oblique floorplate connections and programmatic opportunities

01 ramp perpendicular
02 ramp alongside floorplate
03 stair

01 theater ramp
02 courtyard
03 double ramp
04 folded ramp with center platform

05 folded ramp with oblique surfaces

06 folded stramp

04 double stramp stack

05 connecting level II

06 connecting level III
07 folded landscape

08 stair-strap-ramp combination

09 stacked systems
Ambiguity

The oblique creates moment of ambiguity as program and circulation merge, split or overlap, as programs comes edge to edge. The adjacencies can be augmented or diminished by methods such as splitting for daylight, use or the absent of enclosure creating large topographic floor plates. The intensification of public access contributes to the qualitative aspect of density as well.
**Between 3 Meter & 5 Meter**

The oblique operates and negotiates between two programmatic systems, the social and the commercial. With each system inherits its own set of distinct floor heights and programmatic parameters, discrepancies between 5 meters (commercial) and 3 meters (social fix) floor heights are identified as moments to privilege circulation, public space, daylight requirements or flexible social program (social flex).

Between the 3 meters and 5 meters, the width and length of the oblique grammar fluctuate, connecting the height difference of 1 meter, 2 meters, 3 meters, and 4 meters. This provides variables which can be manipulated in the design process. Like volume nodes, the stairs can be stretch to become a theater or stramp squeezed to become a library façade.
2 meters connection

3 meters connection
connecting through the different levels
Design

The design process takes on previous research and studies and crafted a methodology constructing a new social fabric in superblock that is destined to be filled with block of commercial and office buildings. Assuming that, fire truck access and codes are used to create the set of building footprint. Integrating the transportation hubs such as subway and bus station, moments of access across sites are identity and re-interpret with the building footprint to create a ground level plan for the site. This plan, not only inform the footprint of the commercial building, the void between buildings becomes the opportunity for the social programs and housing, circulation, public parks and open spaces in the mid air.

Then in the reverse order, the parameters required for the social program such as daylight for housing and circulation push and pull the boundary along the commercial space, thus, influence and form the overall massing and volume of the commercial buildings. This process involves the two main fabric of the thesis, the commercial which entails retail and offices which are 5 meters floor height, the social which retails a library, tourist information center, sports fields, circulation, parks and courtyards. Within the social fabric, there is social fix, 3 meters floor height interval such as housing, sports field and portion of the library, and social flex where the program has flexible floor heights.

The process repeats itself as the social flex, the oblique, negotiates back and forth between the social fix and commercial floorplate to fulfill an sufficiently dense mixed-use development.
The Urban Diagram

The process which occurs around the site as the social fabric is removed for commercial program, the programmatic diversity is reduced to a homogenized shopping district.
Initial diverse scales and programs

New commercial development

MAKE SPACE: removal of low density housing

MIXED-USE: residential & commercial

REMOVAL: additional residential neighborhood

REMOVAL: schools + social program

NEW FABRIC: majority commercial functions

REMOVAL: schools + social program

MIXED-USE: commercial & residential

MIXED-USE: retail / office

MIND the GAP: social infill between commercial
Creating ground level building footprint and circulation access

80 meters of maximum block width is established.

Images of massing model showing overall organization. Trapezoid representing the commercial block. The score grid is the structural grid for the space truss supporting the large floor plates. Transparated strips between commercial represent social programs. The white trip on top represents housing.
GROUND LEVEL: void
HOUSING BAR: orientation
HOUSING BAR: densify bars
DAYLIGHTING: offset

10 - 15 DEGREES
Program Massing

West view of massing
East view of massing

BLOCKS: commercial program
CONNECTIVE TISSUE: social program
SPORTS: active program
Social fix, Social flex, Commercial fix

3m social fix floorplates
33,410sqm
housing / theater / sport courts

oblique social flex floorplates
22,440sqm
library / information center / parks / circulation

5m commercial floorplates
115,856sqm
entertainment / retail / offices

COMMERCIAL FLOORPLATE: spatial experiments / vertical continuity
INFORMAL ARENA: entrance hall from subway station

FOLDED SPACE TRUSS: light mesh wrap

Structure Design

01 column field

02 directional truss

03 space truss

01 membrane covers underside of space truss

02 space truss plan / light steel cable - tension members

03 steel mesh forms underside of oblique connective tissue

COMMERCIAL FLOORPLATE: spatial experiments / vertical continuity
STUDY: horizontality within structural systems
FOLDED SPACE TRUSS: light mesh wrap
INFORMAL ARENA: entrance hall from subway station
Structure Studies

01 column tube

02 column field

03 upper and lower involution

04 floorplate involution / bamboo

05 tubular truss

06 spiral involution
SECTIONAL PERSPECTIVE: unfolding of connective tissue
View of Underground Level
Subway Level Plan 1: 2000

1) Core Foundations
2) Subway Station
3) Underground Lobby
4) Parking
5) Grocery Store
View of New Ground Level + 2 meter
1) Vertical Circulation Hub
2) Vehicular Access to North
3) Vehicular Access to South
4) Commercial Floorplate
5) Entry to Tourist Center
6) Library Entrance

Half Ground Level Plan 1: 2000
View of Mid-level Library
1) Badminton Courts
2) Basketball Fields
3) Theater
4) Library
5) Tourist Information/Gallery
6) Outdoor Plaza
7) Commercial Office

Upper Level Plan 1: 2000
View of Housing Courtyard
1) Apartment Unit
2) Lightwell
3) Roof Garden
4) Residential Block
5) Lightwell
6) Elevator Core
7) Community Space
8) Housing Courtyard
9) Central Plaza Below

Housing Level Plan 1: 2000
COMMUNITY LIBRARY: stepping bookshelves / multiple levels within two stories / reading areas on folded oblique
COMMERCIAL PROGRAM: flexible open floorplates for large scale commercial use
HOUSING PROGRAM: open courtyard for residential neighborhood + lightwells for lower levels
Daylighting Strategies

Oblique floorplates peel back to reveal openings for lightwell.

Top Right
Light metal structure to supporting lightwell opening.

Bottom Right
Oblique floorplates peels up to create opening for daylighting.

Facing Page
Model showing daylighting opportunities.
COMMUNITY PARK: badminton courts and public open space
Sectional Model  Scale 1:50
Bibliography


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Images:
All Images are created by the author unless otherwise noted.