

POLITECNICO DI TORINO
FACULTY OF ARCHITECTURE,
MASTER DEGREE IN ARCHITECTURE, CONSTRUCTION CITY
ACADEMIC YEAR 2020-2021
TURIN, ITALY



Politecnico
di Torino



Universidad Central
de Venezuela

PROTOTYPE 2020

A proposal for Shenzhen's post- covid 19 problematic.

AUTHOR

Sebastian Javier Silva Machado

TUTOR

Valeria Federighi

CO-TUTOR

Monica Naso

TABLE OF CONTENT

METANARRATIVE	7	PROTOTYPE	71
INTRODUCTION	9	Typological Sampling	72
SHENZHEN 2020	11	Fitting Analysis	80
- Context		Proposal	82
China Context	13	Material Analysis	84
Shenzhen Context	18	Envelope Cost Feasibility	86
- Problematic	22	Prototype 2020	88
Problematic Affordable housing	24	Office Buildings Implementation Example	92
Building Vacancy Rate	26	Internal Modules	94
- Pandemic	33	Residence Roof Implementation Example	96
What we learn?	34	External Modules	98
HOME WORKING	37	Affordability Approximation	100
Timeline	40	POSITIONING THE PROJECT	103
The trend	43	Stakeholders	105
Examples	44	Phases	111
Pros & Cons	45	CONCLUSION	115
Current Apartment Situation	46	BIBLIOGRAPHY	116
CONCEPT	51	SITOGRAPHY	117
Opportunities identification	52		
Facts & Speculations	56		
Study Cases	58		
Aim	69		

METANARRATIVE

The idea of working in the Shenzhen's problematic 2020 arose as a result of a series of events in which I had the opportunity to participate in the year 2020.

This year, in the midst of the pandemic, the Polytechnic of Turin held a contest called BAC (best architecture contest). The project consisted of designing a house that is resilient to the covid-19 problem, where all kinds of activities could be carried out, maintaining the necessary protection against the virus. This made me reflect on the space of the house, and how it had to evolve in order to support the needs that arose in 2020. Added to this was the fact of home working, a way of working that was being replicated by many companies and it was becoming the reality. Now the house not only had to be a home, but an office, gym, entertainment center, area for study, disinfection area, among many others. Therefore, the space that we considered home was being pressured to evolve.

After this, I began a study on the covid-19 pandemic and its impacts, which led me to meet the Professors Valeria Federighi and Monica Naso, current tutors of this thesis. With them, I began a joint investigation with Professor Michele Bonino (Polytechnic of Torino), Professor Doreen Heng Lui (University of Shenzhen), Silvia Lanteri (Polytech-

nic of Torino) and Lui SI (University of Shenzhen) about the current situation and problems in the city of Shenzhen, in southern Guangdong province of China. In this study, we identified a number of problems the city was experiencing, including the problem of affordable housing and the high office building vacancy rate during the pandemic. The objective was to create a workshop later, in order to find solutions to the identified problems. The workshop was held in September 2020, and it yielded interesting results.

These experiences and studies carried out reflected a series of problems in the city of Shenzhen that referred to two types of spaces, the office and the home. Hence my concern to find a solution for them.



INTRODUCTION

This research work seeks to create a solution for the problem housing and office in the city of Shenzhen in 2020.

This year it has brought to light a topic of great relevance such as the Covid-19 pandemic. This has impacted society in such a way that it has made changes in the daily life of the majority of the world's population, what was known as normality changed. For the city of Shenzhen this affected certain areas of the city and raised problems in the home and office spaces. These spaces have been among the most affected in the city due to the forced mobilization of labor from offices to homes. Added to this, is the fact that Shenzhen already had certain problems in these types of space, thanks to the fact of being one of the protagonists of this great era of change for the asian country of China. That is why this studio attempt to find a solution for them.

The study also seeks to analyze the trend of home working and the impact it has on these types of spaces, in order to learn from it and find a solution more in line with the inclination of the moment.

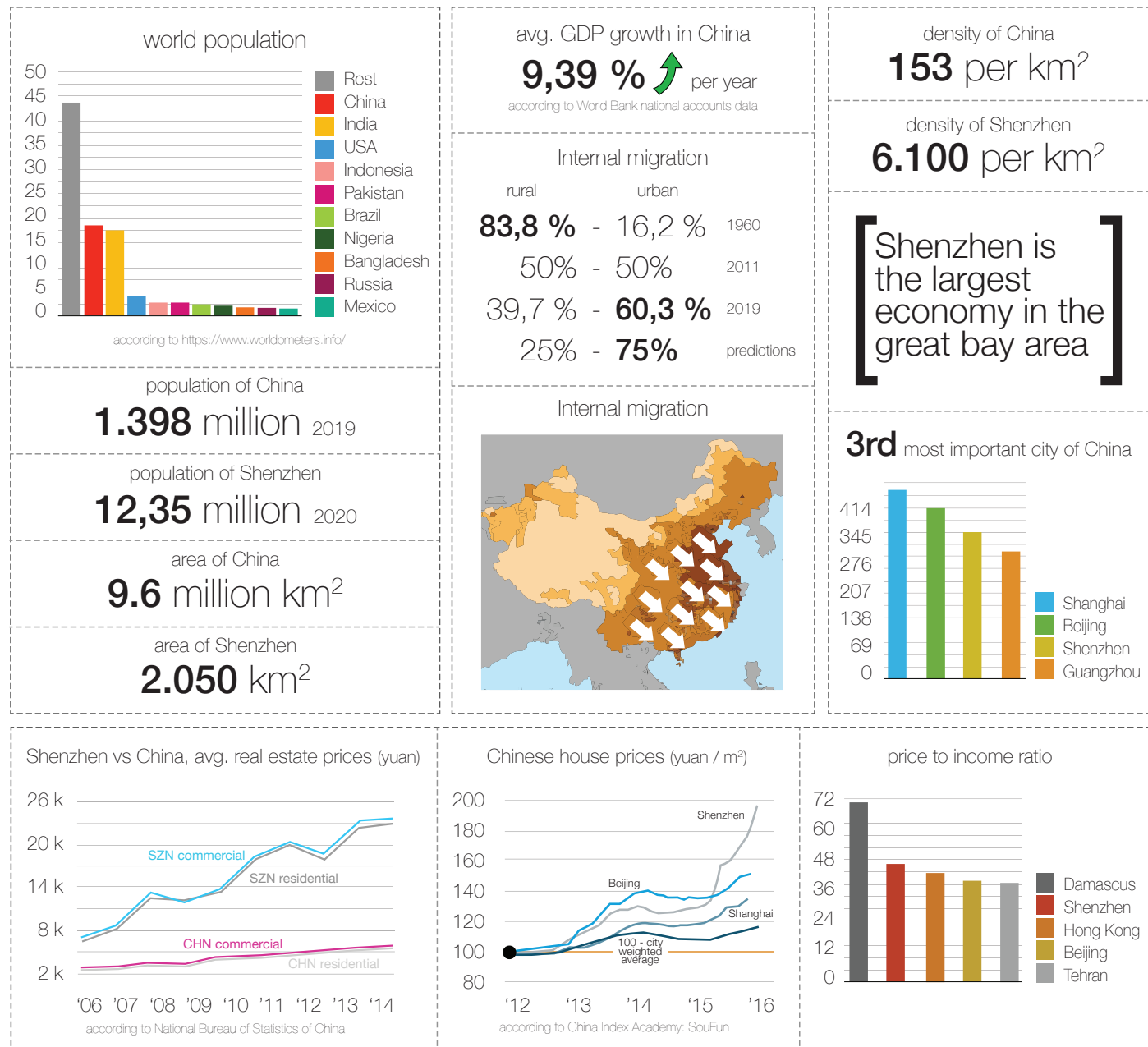
Consequently, after studying the problem and the trends, it is proposed to investigate the city of Shenzhen and the possible sites to exemplify the project, with the intention of generating different places to which to adapt the proposal. After this,

the vision and concept of the idea to be proposed will be identified. Finally, a functional prototype that provides a solution to the problem raised in the city of Shenzhen 2020 will be presented, the prototype must function not only in a specific place, but also as a systemic process that can be followed by the city of Shenzhen.



01 SHENZHEN 2020

CHAPTER ONE



SHENZHEN 2020

CONTEXT OF CHINA



Source: <https://www.firstpost.com>

The population of China is 1.398 million by the end of 2019, a figure that maintains it with the biggest population in the world, followed by India with 1.366 million. From 1960 to 2020, its population has multiplied by x2.18, according to data from <https://data.worldbank.org> (Figure 1).

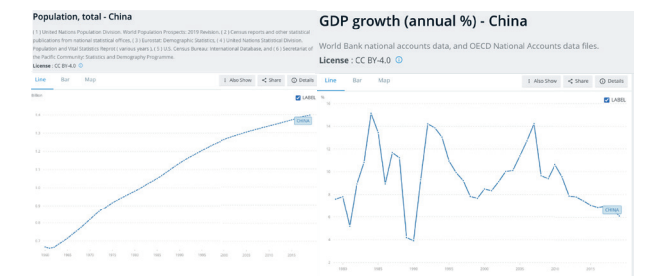


Figure 1 - 2

Source: data.worldbank.org/

Since the introduction of economic reforms, China's economy has grown substantially faster than during the pre-reform period and, for the most part, it has avoided major world economic shocks. In the period from 1979 to 2019, China's real annual GDP averaged 9.39% growth per year (according to World Bank national accounts data, and OECD National Accounts data files. (Figure 4). This has meant that, on average, China has been able to double the size of its economy every eight years. FIG 2

Its economic boom, located in the big cities, has made China a country of great changes in its population. In the last 60 years, it has been possible to visualize the great internal migration that has arisen in this Asian country into the cities. By 1960, China had 83.8% of its population rural and 16.20% urban. This, encouraged by its economy, was inverted in 2011 when its urban population exceeded the rural one, maintaining a trend towards urbanization of its population until today, according to World Bank national accounts data (Figure 3). Its record for the year 2019 is 60.30% of the urban population vs 39.70% of rural population, and experts predict that it will be 75-25 for the next few decades. FIG 3

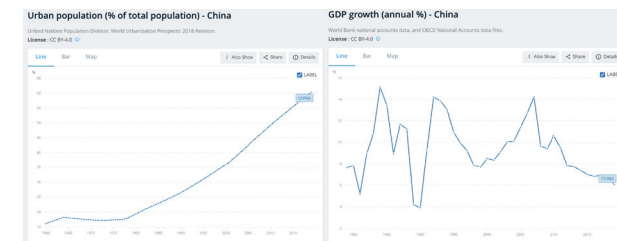


Figure 3 - 4

Source: data.worldbank.org/



NB: The thickness of the arrow indicates the strength of the flows. Source: MISC, 1991.

- High internal migration causes cities in China to experience a sustained increase in their population, which, by not replicating in the same way on the surface of cities, generates an increase in their density. (Figures 5 and Figure 6)

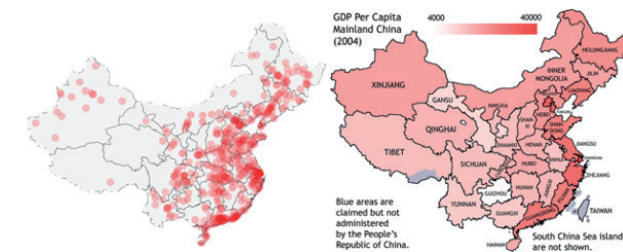


Figure 5 - 6

To understand the current period that the city is going through, we have to understand the metamorphosis that this city has undergone during the last 40 years.

The modern history of this city begins in 1978, when it was only a small town with an area of 3 km². By January of this year, a Central Inspection Team sent by the State Council investigated the possibility of creating a new outer commercial port in Bao'an County. At that time, the population of the town was about 25,000 people.

The following year 1979 would be crucial for this city, when on January 31 the Central Committee of the Communist Party approved a plan to establish the Shekou Industrial Zone in Shenzhen, with the idea of "leading domestic and foreign operations" over the systems of Hong Kong and Macau. By March, the name of Bao'an County was officially changed to Shenzhen and the city would establish six districts: Luohu, Nantou, Songgang, Longhua, Longgang and Kuiyong. By April of the same year, the option to establish a "trade cooperation zone" in Shenzhen, Zhuhai and Shantou would be discussed. Fact that in the same month would be approved with the intention of "increasing foreign exchange earnings", and it was agreed to test the first special economic zones (SEZ) in Shenzhen, Zhuhai, Shantou and Xiamen.

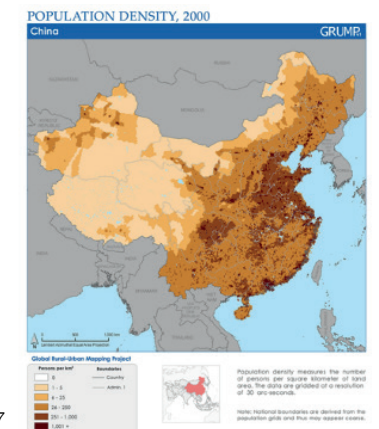
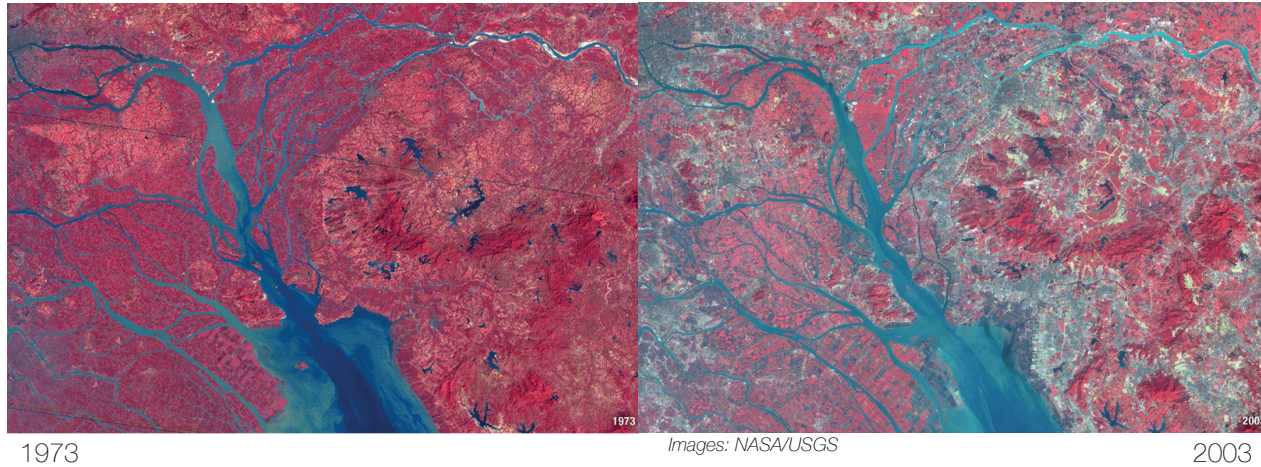


Figure 7



SHENZHEN 2020

CONTEXT OF SHENZHEN TRANSFORMATION

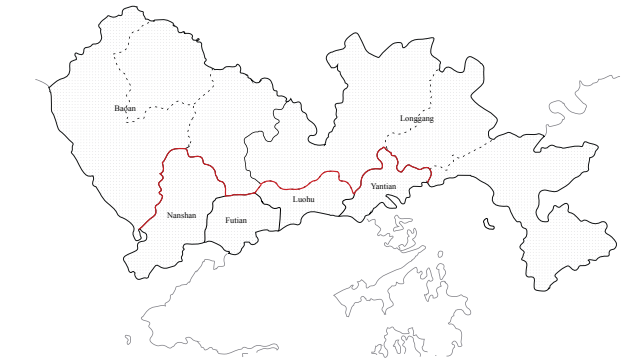


Since this year (1979), when the special economic zone treaty was agreed, the city of Shenzhen has experienced exponential growth that can only be understood with some relevant data:

- Shenzhen used to be a small town with an area of 3 km² in 1978 - 390 km² in 1979 - 1,997 km² in 2010.
- The Story of Shenzhen: Its Economic, Social and Environmental Transformation with a total length of 285 km, making Shenzhen one of the top 10 global cities in terms of subway length in operation.
- Shenzhen is connected to more than 36 overseas cities by air.
- The handling capacity of Shenzhen Port has grown to 25.2 million TEUs (twenty-foot equivalent unit) containers per year, becoming the second largest port in the world for five consecutive years.
- In 1978, the population of Shenzhen Town in Baoan County was about 25,000. In 1979, Baoan County was converted to Shenzhen City, with a permanent population of 314,000. In 2018, the registered permanent residents stood at 12.5283 million, and the number of actual population served by local government exceeded 20 million. The urbanisation rate was 100 per cent.
- In 2017, the average age of the permanent population was 32.5 years, and the main labor forces aged 15 to 44 accounted for 76 per cent.
- At the same time, urban residents' disposable income per capita rose from 1,915 yuan in 1985 to 52,938 yuan in 2017, a 26.6-fold increase in 32 years, registering an annual growth rate of 10.9 per cent (Figure 1).

Images: NASA/USGS

2003



- Its GDP soared from 196 million yuan in 1979 to more than 2.2 trillion yuan, increasing 2,152-fold over 38 years with an average annual growth rate of 22.4 per cent.
- During the same period, GDP per capita grew from 606 yuan to 183,100 yuan, an increase of 56.3 times with an average annual growth rate of 11.2 per cent.
- In 2018, Shenzhen's GDP hit 2.42 trillion yuan, overtaking Hong Kong for the first time (Figure 2 and 3).
- From 1979 to 2017, Shenzhen's total export volume grew from \$9.3 million to \$244.221 billion, up by 9,565-fold with an annual growth rate of 27.3 per cent over the last 38 years.
- In 1978, Shenzhen was a small traditional agricultural and fishing town. In 1979, it started to engage in processing and small production trades: that is, processing materials or given samples and assembling components.

- In 2018, it became a regional financial centre, China's economic centre, and a global technological innovation centre.
- Shenzhen is home to seven Global Top 500 companies such as Huawei, Ping'an, Tencent, Vanke and Evergrande. Huawei, Tencent and DJI have grown into internationally reputable tech companies.

Source: *THE STORY OF SHENZHEN*, UN-Habitat, 2019.

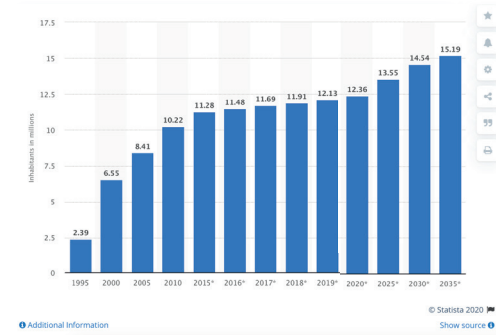
SHENZHEN 2020

CONTEXT OF SHENZHEN CURRENT SHENZHEN

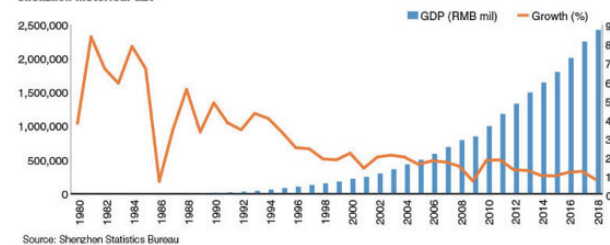
Shenzhen is a sub-province city of the People's Republic of China. It is located in the delta of the river of pearls, on the southern coast of the province of Canton. It is the third most important city in the country, after Beijing and Shanghai and it is currently divided in 10 districts: Futian, Luohu, Nanshan, Yantian, Bao'an, Longgang, Guangming, Pingshan, Longhua and Dapeng.

Categorized as a fast-growing city, Shenzhen is an attractive center for a growing number of young Chinese people who want to start and develop their careers. Located next to Hong Kong, one of the main financial and commercial centers of the world, it has had an unmatched growth, managing to economically surpass it in 2018. Shenzhen represents the largest economy in the Great Bay Area and usually it is also called China's Silicon Valley, as many of China's tech giants are based there. As a rising financial center, Shenzhen is also home to one of mainland China's two stock exchanges.

Population of the urban area of Shenzhen, China from 1995 to 2035
(in millions)



Shenzhen historical GDP



The Exponential Growth of Chinese Cities

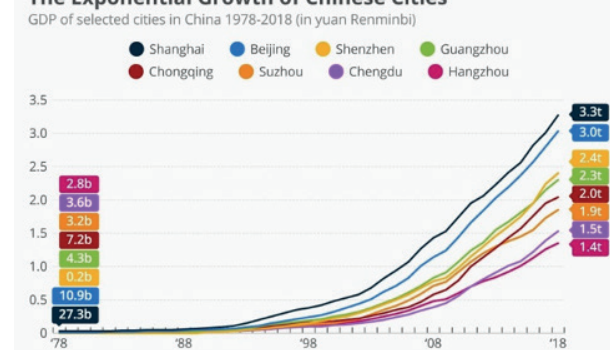
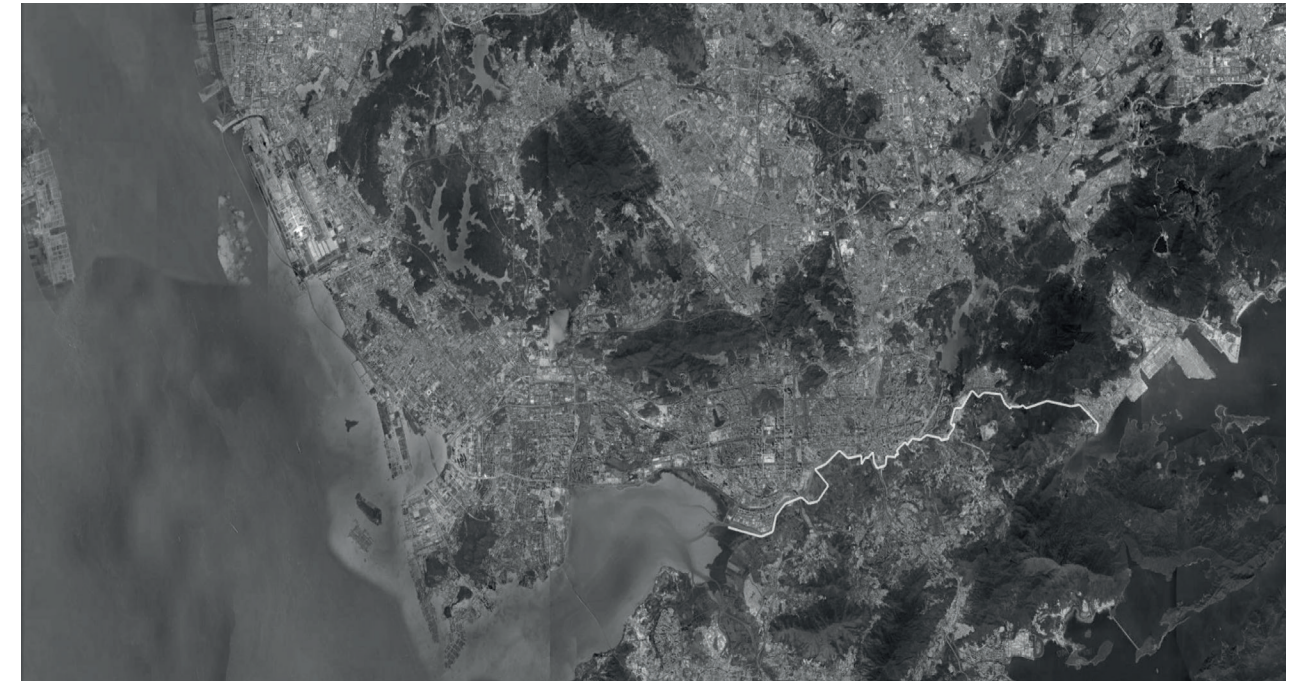


Figure 8-9-10



- Attracted by its rapidly developing economy, people from all over the country have moved to Shenzhen to seize the opportunity to obtain new jobs and life opportunities. In its 40-year development, countless migrant workers have contributed to this city's construction projects and labor-intensive manufacturing production.

Many young graduates have found it easier to find work in Shenzhen compared to other top-tier cities. Promotion opportunities have attracted the best talent from many sectors to come to this city. Consequently, with the increase in population, the cost of housing in Shenzhen has also seen a drastic increase.

PROBLEMATICS

AFFORDABLE HOUSING

THERE IS CURRENTLY A SHORTAGE OF AFFORDABLE NEIGHBORHOODS IN SHENZHEN. IT IS VERY DIFFICULT FOR THE LOW- AND MIDDLE-INCOME WORKING CLASS TO FIND AFFORDABLE HOUSING THAT MEETS THEIR HOUSING NEEDS AND PREFERENCES



OFFICE BUILDING VACANCY RATE

BY MARCH 2020 THE BAO 'AN DISTRICT REGISTERED A **52%** OF OFFICE BUILDING VACANCY RATE AND AN AVERAGE OF **27%** FOR THE ENTIRE CITY



SHENZHEN 2020

AFFORDABLE HOUSING

Given the information explained in the previous chapter, the population situation of Shenzhen generates as a consequence the problem of affordable housing, since there is currently a shortage of affordable neighborhoods. The square meter (m²) of housing construction is quite high compared to the average income of a family. It is very difficult for the low- and middle-income working class to find affordable housing that meets their housing needs and preferences. This group, also called the “sandwich class” (from Marco Bontje), represents people who earn too little to pay rents in the commercial market, but too much to opt for public housing.

This leads many to seek solutions to their affordability problems by sharing their apartment with others, creating extremely small living spaces of very poor quality, which may temporarily solve the problem, but is not the most desirable solution in the long run. These shared apartments, or in some cases one-room apartments (by subdividing them), represent one of the most important needs of the citizens of Shenzhen. The subject of housing, and how the people spend their lives looking for their own home (words

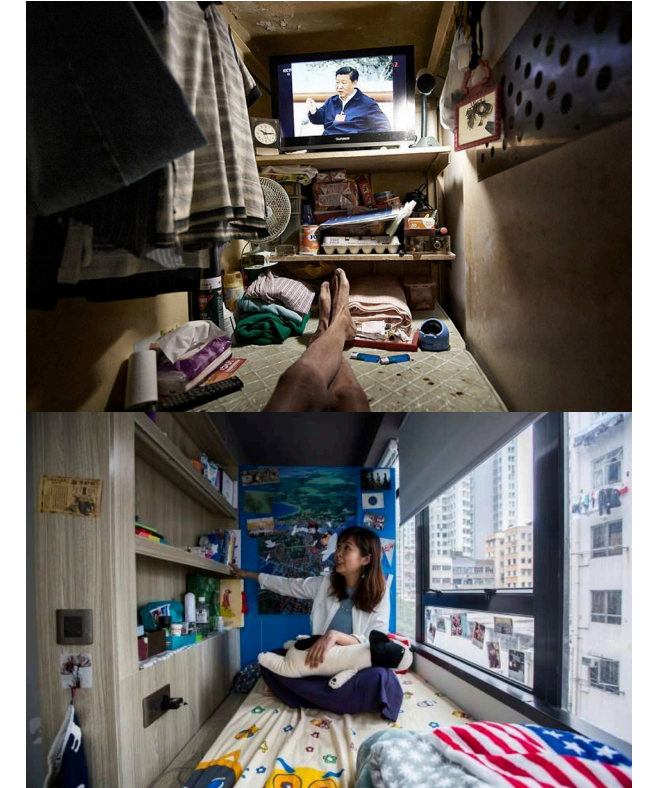
of a student from the University of Shenzhen who participated in the workshop, the Shenzhen-Ness). Some people consider urban villages their only affordable option. College students often share apartments or even small rooms.

The phenomenon of shared apartments is a typical solution for high-income, high-density cities, as can be seen in neighboring Hong Kong. This problem has existed in Shenzhen for several years and has intensified with its growth. So, the phenomenon of subdividing apartments into smaller spaces in order to generate more affordable housing can be defined as “normal” in Shenzhen.

Consequently, this leads to affordable houses of very low spatial quality, where people live in a single room or worse still in a single bed, in order to survive. Although these spaces provide them with a home of their own, they imply the need for the population to have higher quality spaces.



(One Bed Homes)



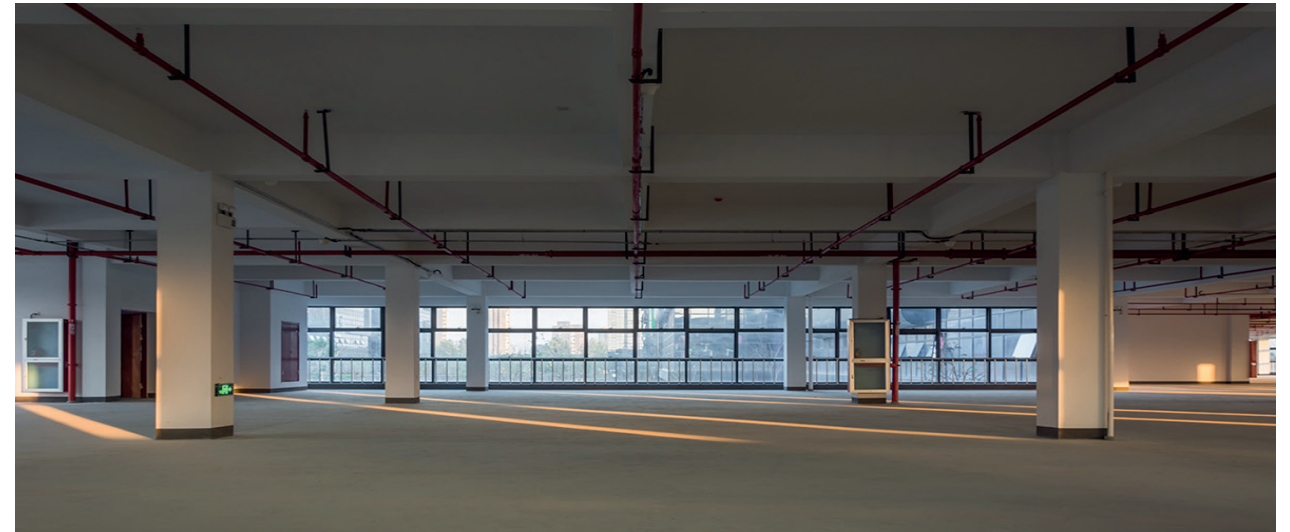
(One Room Homes)

SHENZHEN 2020

OFFICE BUILDING VACANCY RATE

Shenzhen is a city that has been a reflection of the impact of the virus. By March 2020, the Bao 'An district registered a 52% of office building vacancy rate, and an average 27% for the entire city. Opposed to this, home sales increased 41% in the first half of the year 2020, compared to the previous year. Figures that raise new questions about the relationship between these two types of spaces in the city, the office and the home.

There is also a great economic attraction for construction companies to focus their work on office space and commercial use, since these far exceed the selling price of the m2 and therefore the profits of the same. This generates an effect of home shortage and office oversupply, which causes its values to increase and decrease respectively.



Average Selling Price of Commercialized Buildings by use

(yuan / m²)

Year / Region	Average Selling Price of Commercialized Buildings	Residential Buildings	Villas, High - grade Apartments	Office Buildings	House for Business	Others
2016	7476	7203	15911	14332	9786	4832
2017	7892	7614	14965	13543	10323	5364
2018	8737	8544	16242	14385	11150	5351
Guangdong	13073	12915	17865	22244	15333	7317



**LIMITED SEZ AREA
+GROWING CITY**

GROWING ECONOMY

**HIGH DEMAND ON
OFFICE BUILDING M2**

**INCREASE THE CON-
STRUCTION OF M2 OF OFFICE**

+COVID-19

HOME WORKING

**IMPACT ON THE REAL
STATE MARKET**

**HIGHEST VACANCY RATE
IN OFFICE BUILDINGS**

**LOW QUALITY OF
LIVING SPACES**

**SHARED
APARTMENTS**

**UNAFFORDABLE
HOUSING**

HIGH DENSITY

INTERNAL MIGRATION

**MORE OPPORTUNITIES
OF WORK**

SHEN ZHEN

?

?



SHENZHEN 2020

PANDEMIC

Covid 19 has been an unprecedented global event where it has put everyone under the same problem.

The pandemic, declared this way by the WHO on March 11, 2020, has had a great impact on the economic system that we call normality. This led many countries to create regulations for social distancing, isolation, restrictions on internal circulation, among many others, in order to control the spread of the virus.

We realized that in a matter of days our modern way of life can collapse and that we are not prepared for it. Which in fact cost us dearly and brought many consequences: a record in number of divorces; domestic violence increase; depression due to stress; the rate of abuse of alcohol, drugs, suicides, loneliness rose; gender inequalities are reflected at work and at home, where women are the ones who perform unpaid care work; anxiety levels increased; people had to work from home in small apartments, and in some cases even without internet; among many other cases.

The year 2020 has been a unique year for the world. It was accompanied by a pandemic caused by the Covid-19 virus. This has influenced the lives of many people throughout the year, changing our routines and cornering governments....

WHAT WE LEARN ?

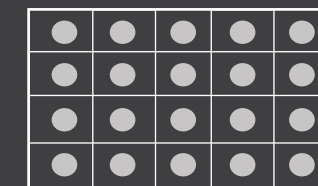
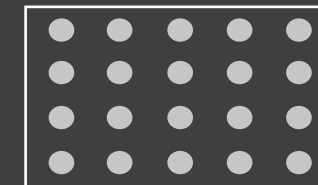
WHAT WE LEARN? | The human evolves through experience, the fact of having lived through this pandemic makes us aware of the repercussions of not being prepared. Finding a vaccine and going back to how we were before would be irresponsible on our part, so we must think about what we can do to improve our spaces, our way of living them and rethink which spaces are truly necessary and which ones need to evolve? What small changes can have a great impact in the future and can be relevant to our society?

Although studying the issue of covid-19 may be currently inaccurate for the fact of drawing early conclusions, we can learn from certain measures and responses that have been seen as a result of this pandemic. And that is what this name refers to, to those architectural responses from which it can be learned from, and which until today have been accepted with success.

The studies presented here will be taken as design premises when generating an architectural solution.

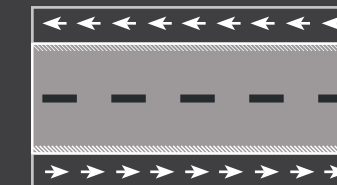
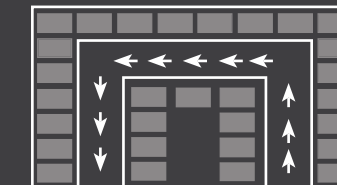
ARCHITECTURAL RESPONSES

SOCIAL DISTANCING



ONE WAY CIRCULATION,
ONE ENTRANCE
ONE EXIT

CIRCULATION



ONE WAY CIRCULATION,
ONE ENTRANCE
ONE EXIT

SANITARY SPACES



SANITATION AS PART
OF OUR DAILY LIVES

LEARN FROM DESINFECTION
AND SANITATION ROOMS IN
INDUSTRY



02 HOME WORKING

CHAPTER TWO

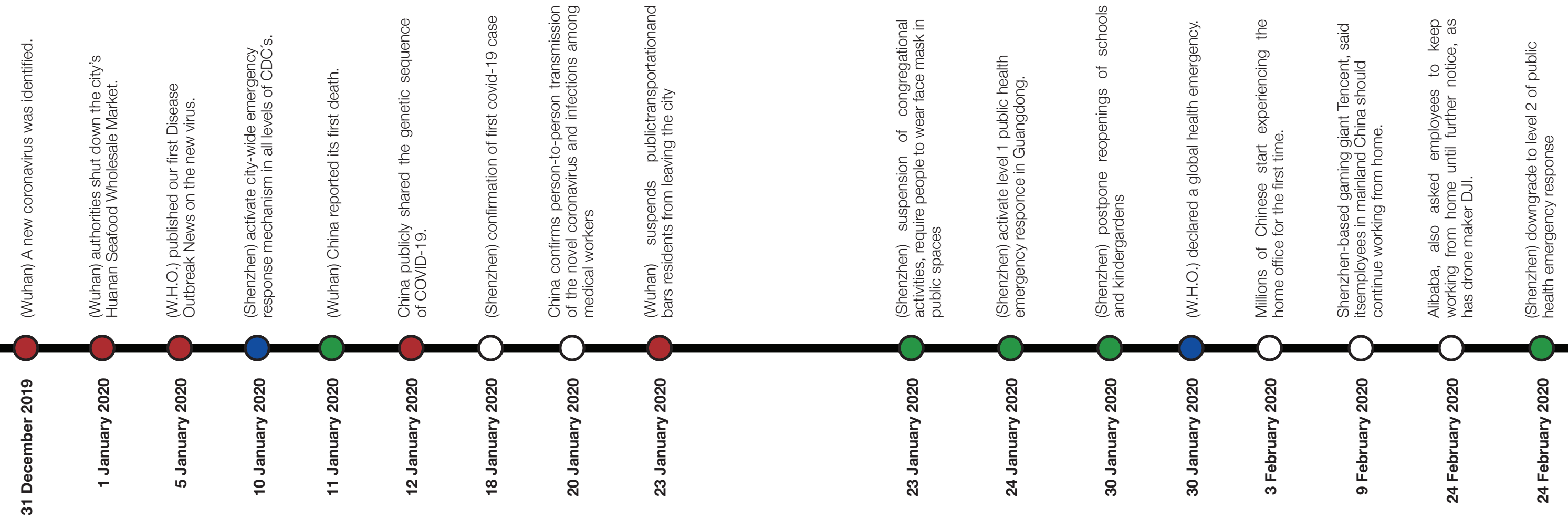
**COVID-19 is a window of
opportunity to enter a context
that in another model we could
not have entered**

SHENZHEN 2020

PANDEMIC

As a matter of chapter introduction, a time-line is shown in order to indicate the previous events that made possible the development of work activity at home, in Shenzhen.

- Wuhan
- Shenzhen
- W.H.O.
- China

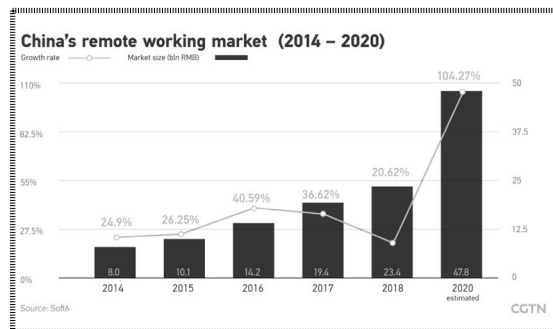


NEW NORMAL?

In February of 2020 more than
200 million people
began working remotely

The habit of going to work every day in an office has been altered, and when a habit is broken is when you can create a new one. **The era of the permanent desk is over David Mott.**

IDC data shows that after the epidemic
22% of people continue to work from home.



Guangdong,
Jiangsu,
and Fujian

provinces are the most active
provinces for online office work.

“Workplace environment demands to continue working from home will lead to rethinking office space”
Alejandro Aravena.

“The pandemic is a problem that is going to be solved by medicine and not cured by architecture. But notions of flexibility are the way that our studio is going to go forward.”
Elizabeth Diller

HOME WORKING

THE TREND

“THE COVID-19 PANDEMIC HAS LED TO A DRAMATIC LOSS OF HUMAN LIFE WORLDWIDE AND PRESENTS AN UNPRECEDENTED CHALLENGE TO PUBLIC HEALTH, FOOD SYSTEMS AND THE WORLD OF WORK”

WORLD HEALTH ORGANIZATION.

2020 was a year in which many professional areas were influenced. In the office work area, for example, many companies have been forced to find new solutions to the way their employees work, in order to comply with social distancing.

Companies such as Facebook, Twitter, Nestle, Vodafone, Tencent, Alibaba, Dji among many others, adopt policies intended to encourage employees to work from home in the short- and medium-term. Facebook and Google have said they will let employees continue working from home for the rest of the year (2020). These policies have forced people to work from home during the pandemic.

This trend, being present in the cities of China, and therefore in Shenzhen, has affected their real estate market. By July 2020, an imbalance was generated in the real estate market after the sale of houses soared 41%, a fact in which the government had to put obstacles in the way of buying houses, and thus normalize the market (according to an article by <https://www.mingtiandi.com>). At the same time, this year, as we saw in the previous chapters, brought up the issue of vacancies in office spaces for the city, marking an average of 27% vacancy for the entire city. So it logically makes us question the intrinsic relationship of these two types of space, and how one directly affects the other.



HOME WORKING

EXAMPLES

Currently several types of home working are handled, among them we can name some:

HOME WORKING example models

- The totally remote office (All days at **Home**)
- The hybrid model (1-2 days office, 3-4 days **Home**)
- Remote "plus" model (1 week office, 3 weeks **Home**)
- Quality time (Expand, offices in several areas and not just a central)
- Hub & Spoke (Where and when you want as long as you do the job) **Home**

Source: <https://www.bbc.com/worklife/article/20201023-corona-virus-how-will-the-pandemic-change-the-way-we-work>

These ones show different approaches that have been created in order to face the crisis, and they represent potential scenarios of what the future of work may be like. Although home working was something that already existed, the Covid-19 gave it a great boost by presenting it as one of the solutions to the problem. For many, it is something that will remain in one way or another in the ways of approaching working.

The quarantine period has shown companies that teleworking is something that can give them economic benefits. According to Global Workplace Analytics, almost 6 out of 10 employers identify cost savings as a major benefit of telecommuting. Rent, utilities, cleaning services, food and taxes are some of the items many businesses are cutting back on. A Stanford study found that remote workers are 13% more productive, compared to their in-office counterparts.

In conclusion, the Covid-19 pandemic has fundamentally changed the way people work. As a result, traditional office jobs may never be the same again. The pandemic forced millions of employees to work remotely, and numerous companies have chosen to make this temporary measure a permanent feature of their business models.

The following pros and cons presented here will be taken as a design premises at the time of generating an architectural solution.

HOME WORKING

PROS & CONS

The following pros and cons presented here will be taken as a design premises at the time of generating an architectural solution.

PROS

- ① There is no commute. (Save time and money)
- ② There is greater flexibility.
- ③ Your home can be far from work (and more affordable).
- ④ Helps lower density in cities and centres

CONS

- ① There is no physical separation between work and leisure time.
- ② You lose living space.
- ③ Relationships are harder to form.
- ④ Depending on your home, you could have poor ventilation and lighting.
- ⑤ Difficult for people with small living spaces.

HOME WORKING

CURRENT APARTMENT SITUATION



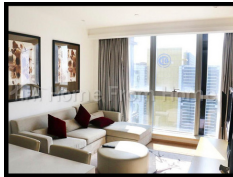
Big Apartment

200-100 m2
1 Family

128 m2
18.000 CNY/Month



90 m2
9.800 CNY/Month



Apartment

100-60 m2
1 Family



Small Apartment

60-40 m2
1 Family



Studio Apartment

40-20 m2
1-2 Persons



53 m2
7.800 CNY/Month

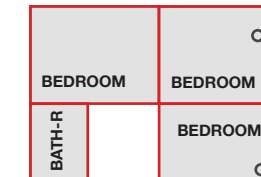


30 m2
5.500 CNY/Month



APARTMENT'S STUDY ON SHEKOU, SHENZHEN
source: <https://www.flatinchina.com/Object/20359>

SHARED APARTMENTS

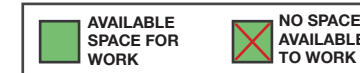


60-40 m2
2-3 Families

They use this spaces
as kitchen, living,
bedroom, study room
etc. all in one room



LEGEND



Problem
Target
Concept
Build and Test

(Affordable housing - Office vacancy rate)

(Address two problems with one approach)

(Make housing in office space and office space in housing)

Build and Test

03 CONCEPT

CHAPTER THREE

CONCEPT

OPPORTUNITIES IDENTIFICATION

Use of Existing Commercial and Office Buildings for Housing solutions |

According to information provided by the Shenzhen University, In recent years, the Shenzhen government has created policies with the initiative of improving the current situation of housing. On the next part, this information attached:

Excerpt 1

Government policy on vacancy and rental housing: “Notice of Shenzhen Municipal Housing and Construction Bureau on Matters Concerning the Reconstruction of Existing Commercial and Office Buildings into Rental Housing “

From January 9th to January 19th, 2020, the Shenzhen Municipal Housing and Construction Bureau through the Shenzhen Municipal Housing and Construction Bureau public opinion solicitation portal website “Shenzhen Housing and Construction Bureau on the conversion of existing commercial and office buildings into rental housing Notice of Matters (Draft for Solicitation of Comments)” has been publicly solicited for comments.

The continued high supply of office buildings has become an urgent problem in first-tier cities. Many cities have successively introduced “commercial subletting” policies to revitalize the stock of idle commercial and office buildings.

Recently, the Shenzhen Bureau of Housing and Urban-rural Development also issued the “Notice of the Shenzhen Municipal Bureau of Housing and Construction on Matters Concerning the Reconstruction of Existing Commercial and Office Buildings into Rental Housing” to discuss the policy of “commercial subletting”.

The notice shows that the existing commercial and office housing projects applied for reconstruction will not change the original land use, land use life and plot ratio, and must strictly implement green building standards and regulations. The reconstructed property management area shall meet the requirements for property management and comply with the relevant provisions of this Municipality on property management. The reconstruction project should be used as a rental housing after reconstruction, but no degree is provided. Within 5 years from the date of approval by the Federation, the leased housing use of the reconstruction project shall not be changed.

Affordable housing and government public plan: “13th Five-Year Plan for Urban Renewal of Shenzhen” (2016-2020) Improve the supporting facilities and the construction goals of “two houses”. This plan puts forward the goal of greatly increasing the construction of public supporting facilities, affordable housing and innovative houses in urban renewal. Specifically, in the urban renewal project, there are no less than 108 public service facilities that occupies independently, the construction area of public supporting facilities is no less than 2.13 million square meters, and the affordable housing



is no less than 6.5 million square meters. The scale of industrial housing is no less than 1 million square meters.

The current situation of Affordable housing in Shenzhen | According to Shenzhen’s “13th Five-Year Plan” report, the completion of the indicator of new affordable housing is not satisfactory.

As of June 2018, a total of 95,000 new affordable housing units have been completed during the “13th Five-Year Plan” period. For 27% of the planned tasks, the completion progress is seriously delayed,

Source: (Info taken from the workshop Shenzhen-ness, given by Shenzhen University, Greater Bay Innovation Design Lab)

The fact that the government have thought in the possibility of changing commercial and office buildings into rental housing give us a space of legal approach in where to dig. Since this project approach its aligned with Shenzhen’s government objectives, that make them a potential ally.

The Reconstruction of existing commercial and office buildings into rental housing is a valuable opportunity to find possible solutions.

CONCEPT

OPPORTUNITIES IDENTIFICATION



Rooftop Communities. Neighboring Cities |

The issue of housing shortage exists in many cities, mainly those that are financial and economic centers of the world. In the Great Bay Area we have three, Shenzhen, Hong Kong and Macau. These cities suffer some similar problems with respect to housing due to its prices, territory, populations and growth. For this reason, their inhabitants have found different ways of appropriating the space of the city, seeking to solve their problems by themselves.

From the preface written by Rufina Wu und Stefan Canham, in "Portraits From Above":

Excerpt 2

"Self-built settlements on the roofs of high-rise buildings have been an integral part of Hong Kong's history for over half a century. Rooftop structures range from basic shelters for the disadvantaged to intricate multi-storey constructions equipped with the amenities of modern life."

"The rooftop settlements are an urban legacy, telling the story of Hong Kong, of political upheavals in Mainland China, of urban redevelopment, of people's hopes and their needs in the city." (1)

According to the thesis From Roof to Ground, these are some references of the rooftop communities:

Excerpt 3

"An interesting case of Hong Kong are rooftop communities, informal settlement constructed above high-rise buildings, built since the 1950s' as answer to the lack of housing, the radically exemplifies the concept of a low-density village of the countryside on the top floor of buildings (1).

"This extraordinary phenomenon could open a debate through the possibility of new evolution of the city. In the Singaporean case, instead rooftop use is so highly debated by the society, that the government has set a project, called skyrise greenery, that motivates, across economic aids, privates in construct greenery installations on the rooftop of their buildings to promote the development of high rise private and public green areas as innovative leisure areas. " (2)

"In Macau, instead, we can see a homogeneous roofscape composed of illegal structures, similar to the Hongkongers rooftop settlements, but without the same sense of community. This is only a rooftop evolution as answer to the rapid growth and overcrowding of the city. " (3)

"Rooftop communities are particular kind of space reclamation in Hong Kong, they could be defined as temporary structure, build on 50s-60s buildings,

that never received a building permission from government. It has become a practice that poor and immigrants' people, not having enough money to buy a regular apartment and not finding place to live on the ground level, move on the top of old buildings by exploiting the roof layer as free building area"

Source: Monteverde Carlo Alberto & Salza Giorgio,

Tesi di laurea "From roof to ground", settembre 2017,

Therefore, we can identify that the housing problem is an issue commonly caused by rapid economic growth, linked to a finite area. In these cities you can find both solutions, the ones driven by governments (Shenzhen's case), and the more genuine solutions created by their inhabitants (rooftop communities). To generate a more comprehensive and sustainable solution, it is pertinent to develop a regulatory framework to support the appropriation of these spaces.

(1) Wu R, CANHAM S., portrait from above: Hong Kong's informal rooftop settlements, Berlin, 2008
(2) National Parks Board, 2017, (www.nparks.gov.sg/skyrisegreenery/)
(3) CHOI S, demolishing illegal structures may be subsidized, from Macau daily times, (www.macaudailytimes.com.mo/archive-2009-2014/macau/36546-demolishing-illegal-structures-may-be-subsidized.html) (2017-08-22)



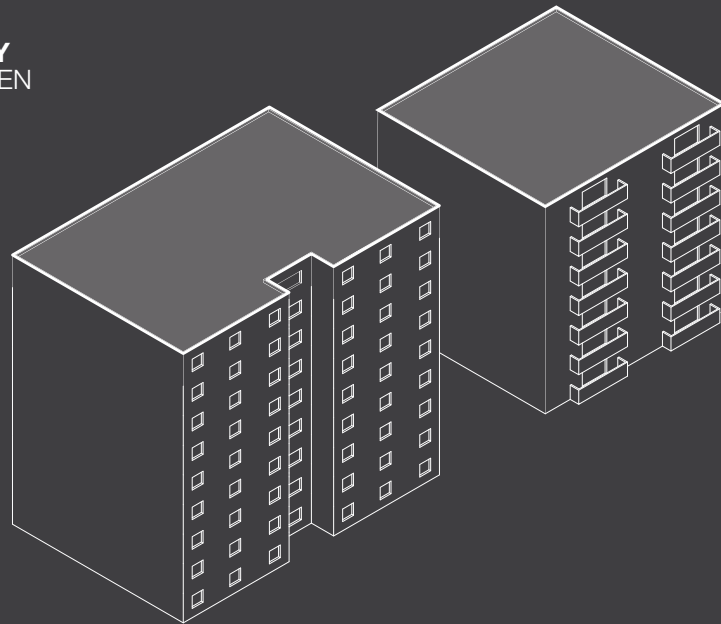
THE FACTS

Once the previous problems have been established, it is sought to generate a response to them.

Fact **A** **AFFORDABLE** HOUSING
NEEDED

Fact **B** MORE SPACE IS NEEDED FOR
HOME WORKING IN SHARED
APARTMENTS

Fact **C** THERE IS A LOT OF **EMPTY**
OFFICE SPACE IN SHENZHEN



SPECULATIONS

speculation **A**

Can we take advantage of the free spaces near residential buildings to give them extra space to work?

Can we take advantage of the roofs of these?

Of the interstitial spaces between buildings?

speculation **B**

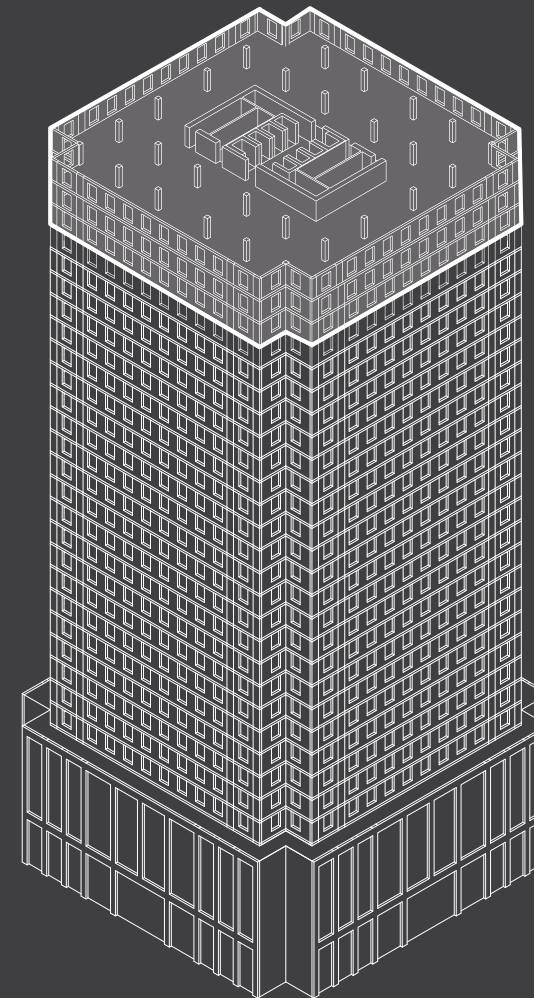
Can we take advantage of the vacant office spaces in Shenzhen?

Can we build homes prepared for home working?

Can homes be made mobile in such a way that the space can be rented for a time but its new use is not permanent?

speculation **C**

Can we solve both speculations (A - B) through a single flexible prototype?



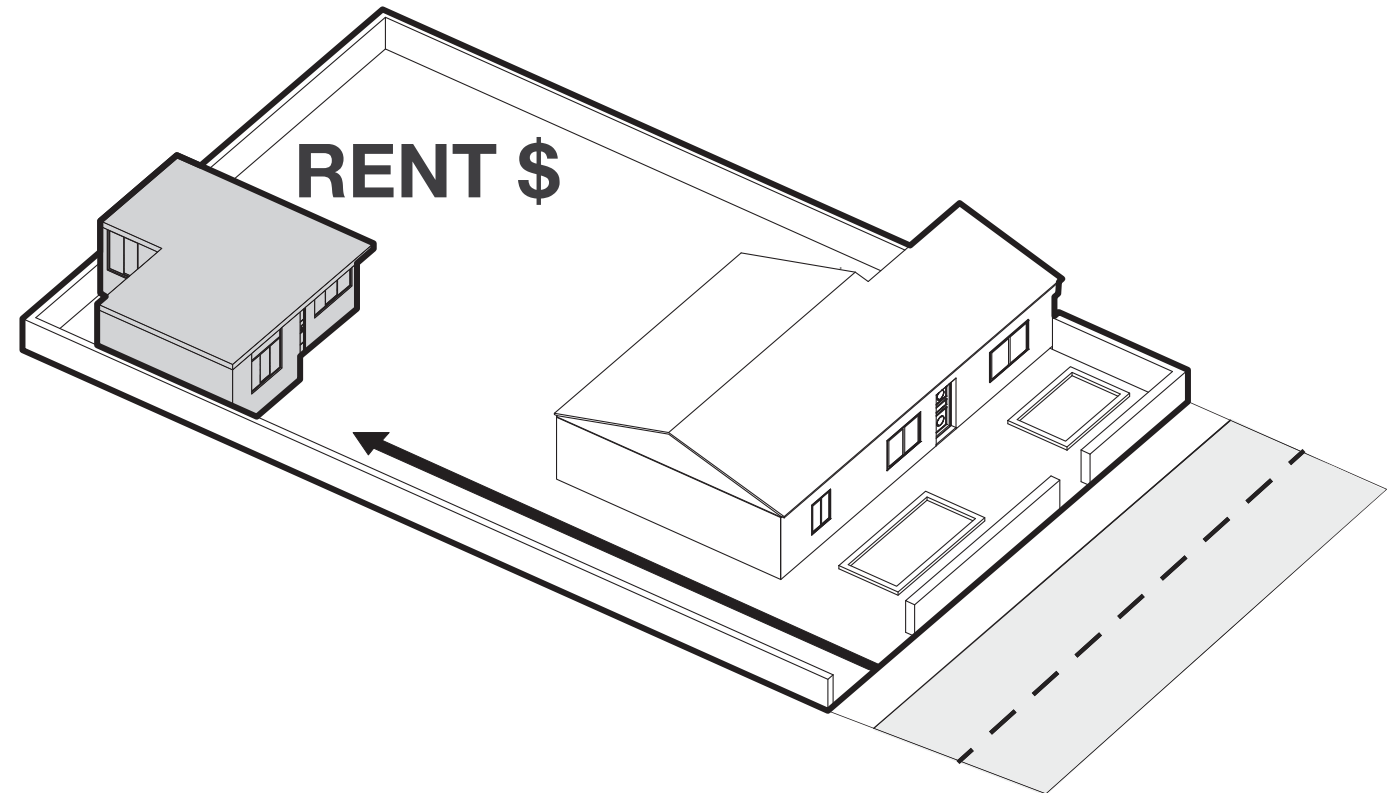
CONCEPT

STUDY CASES

BACKYARD HOMES |

Project located in Los Angeles, USA. It consists of the implementation of housing modules in the courtyards of city houses. The promoter of this project is the LA-MAS firm, which found potential in the large backyards of the big houses in Los Angeles and proposed an implementation of affordable housing modules to help improve the home problems that already existed in the city.

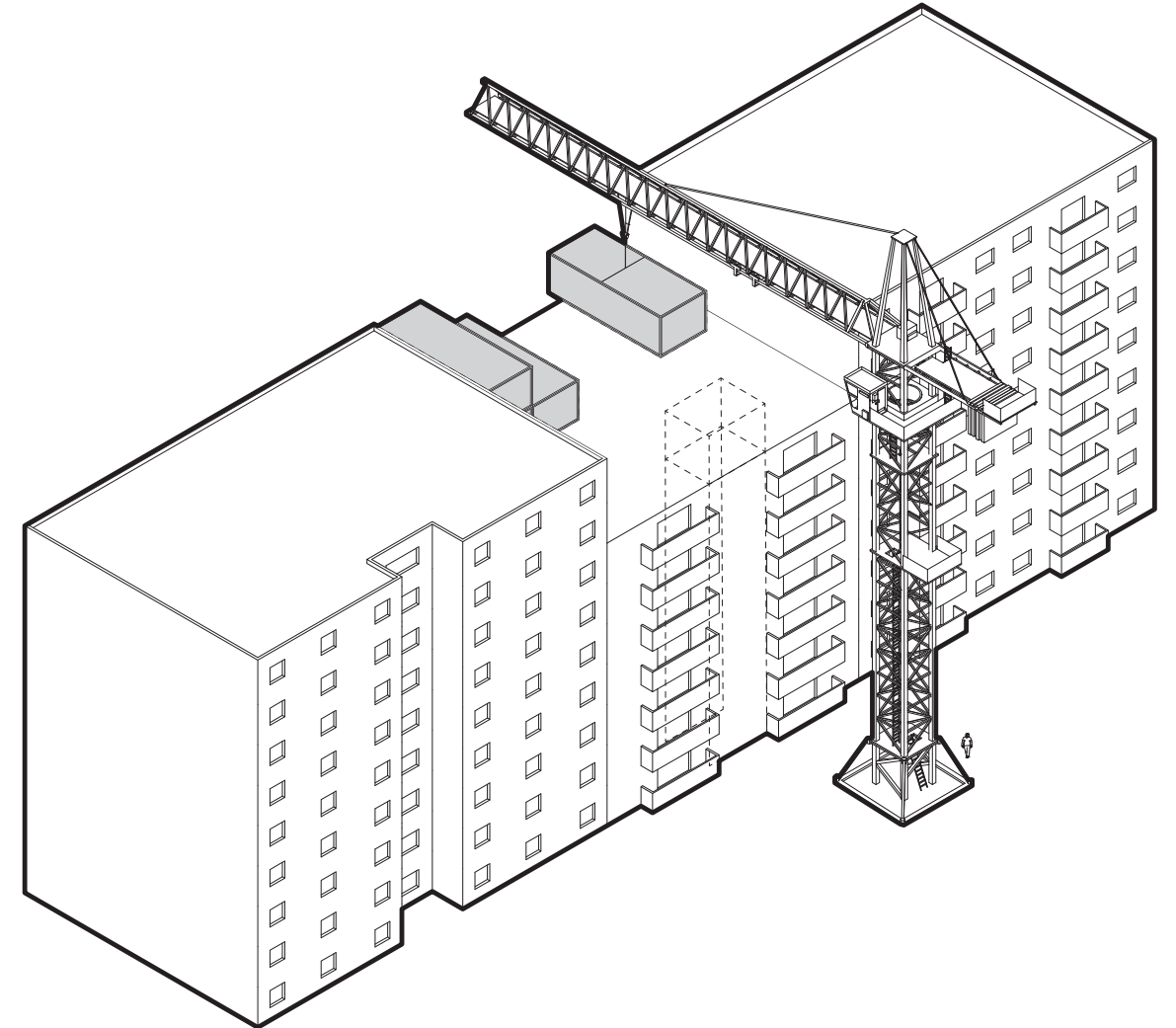
This project is a great reference because of the methodology implemented in the realization of the idea. The firm achieved in conjunction with the Los Angeles mayor's office to make legal the implementation of small-scale housing prototypes in the backyards of houses. This was achieved thanks to an experimentation program through the testing of prototypes in urbanizations and study of their results. This led to a process of scalability, which finally led to the generation of an urban regulation for the city of Los Angeles.



LA CASA POR EL TEJADO |

Project located in Barcelona, Spain. Consists in the implementation of prefabricated houses on the roofs of old buildings. The Project, promoted by the spanish architecture firm, consists into talking to the neighborhood of a building (usually located in the center of the city that does not comply with the established height limit) in order to reach an agreement to allow them to build one or two stories of modern residences on their roofs. The agreements are usually some internal remodeling of the common spaces or the circulation of the building.

The interesting part of this project is how they found a potential in old buildings and manage a way to take advantage of it. In addition to being an innovative proposal, the way they execute the project from start to finish is impeccable, the prefabricated homes are designed to measure, so that the installation process is made in the simplest possible way.

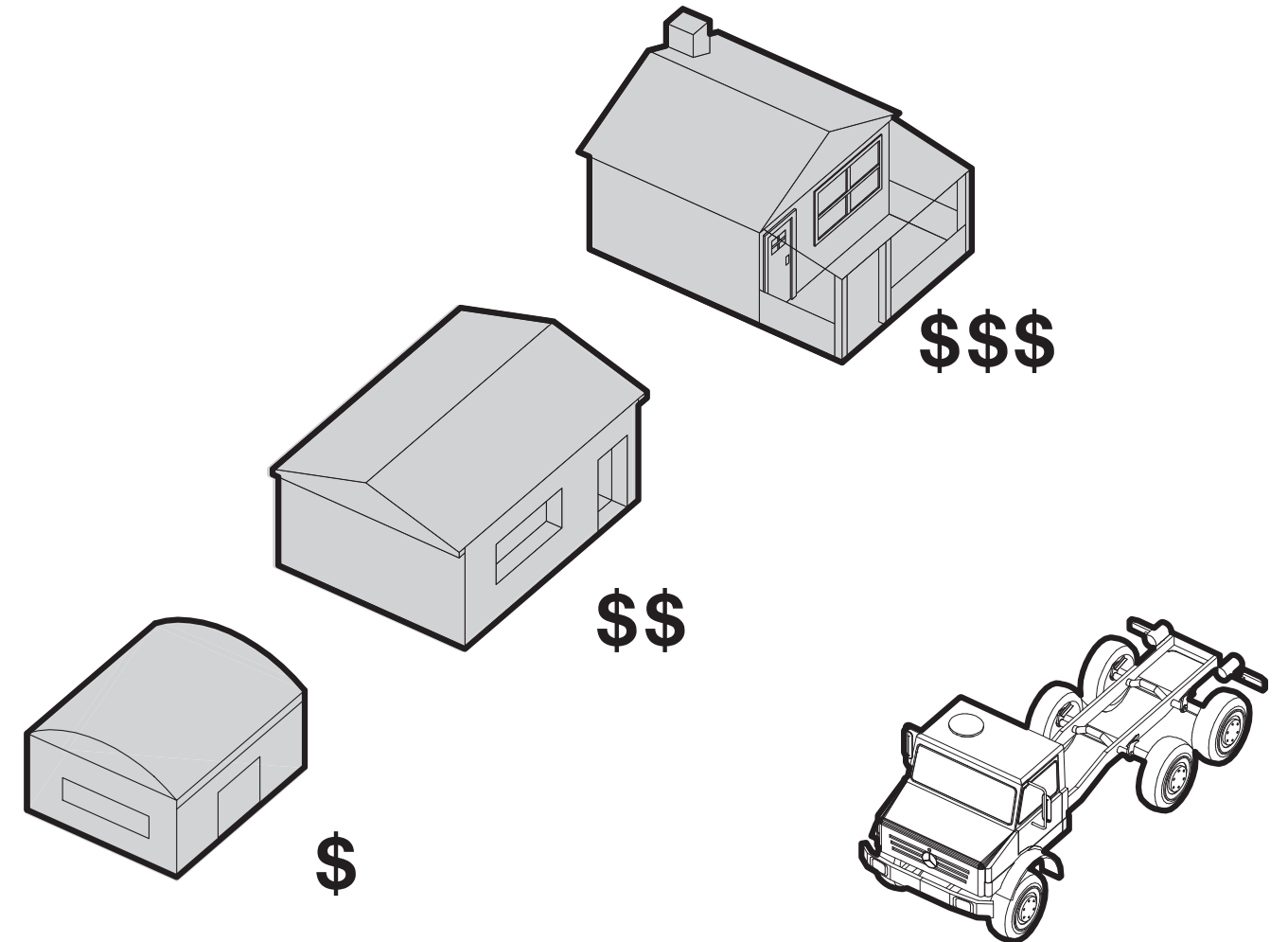


GRANNY PODS |

The so-called granny pods are in simple words a guesthouses on the property of a residence, only with the difference of the certain demands for an elderly person.

A Shed for Grandma, also called, consists of the implementation of a housing module in a backyard to provide a close home to relatives, but at the same time give them privacy. These are legal in several states of USA and typically cost \$ 85,000 on average. They usually come pre-fabricated and is just needed to install it in the patio.

This project is interesting because it provides a fast housing solution with low cost (compared to the traditional ones)

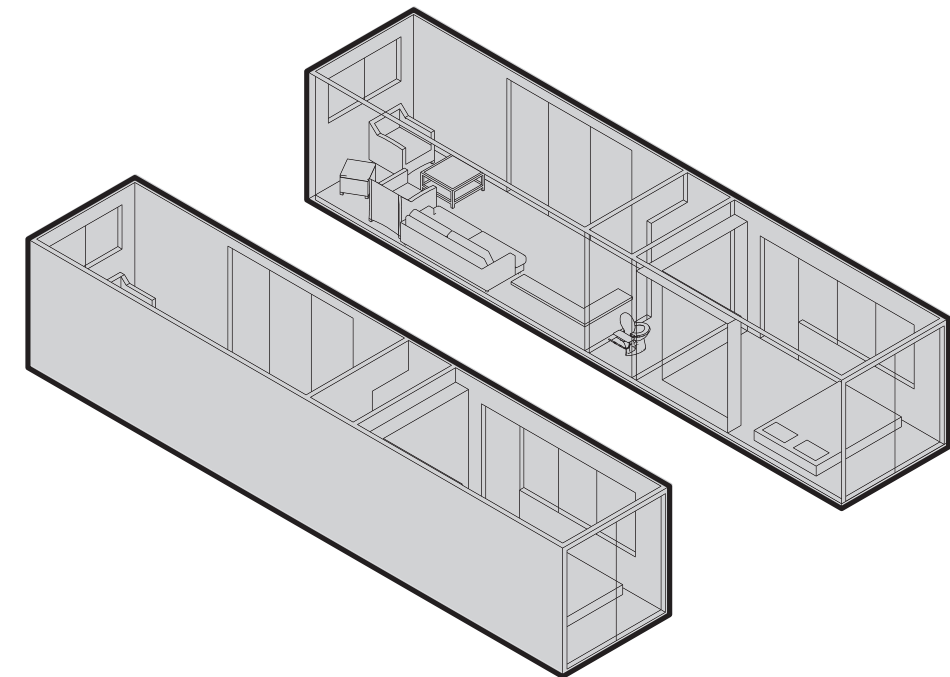




MARKBOX |

This project consists in the generation of affordable housing (around \$ 20,000) in Hong Kong. These are generated from containers and provide a solution to the problem of affordable housing in Hong Kong. Each year, more people are requesting these homes and most are located in illegal areas. The government not having a solution for the problematic of affordable housing turns a blind eye into these homes. For the inhabitants of Hong Kong it is a very profitable solution and therefore is generating a growth to the brand.

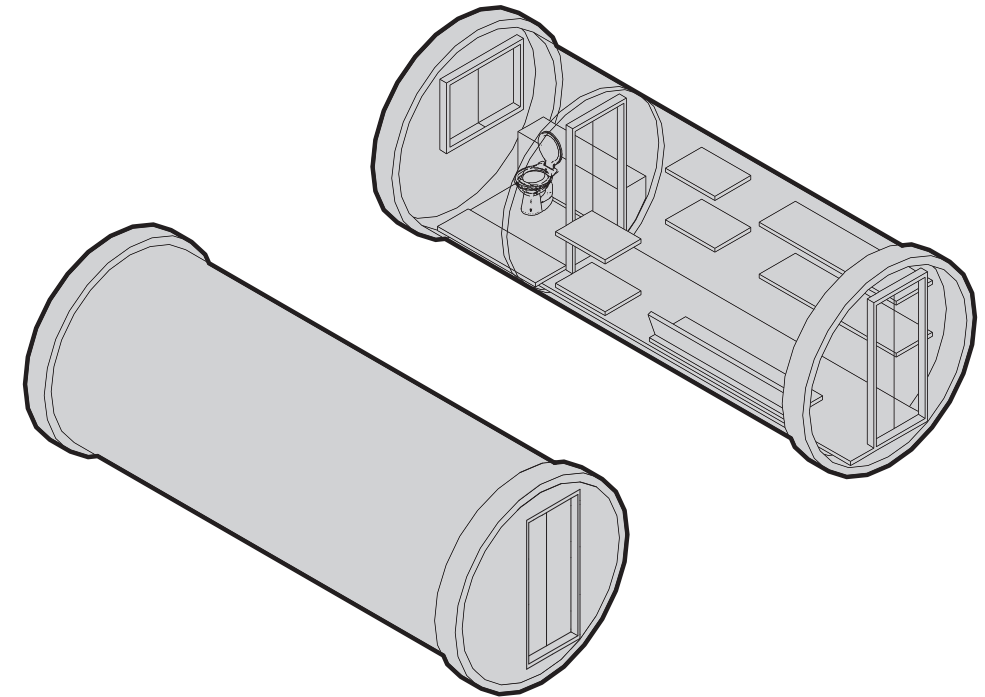
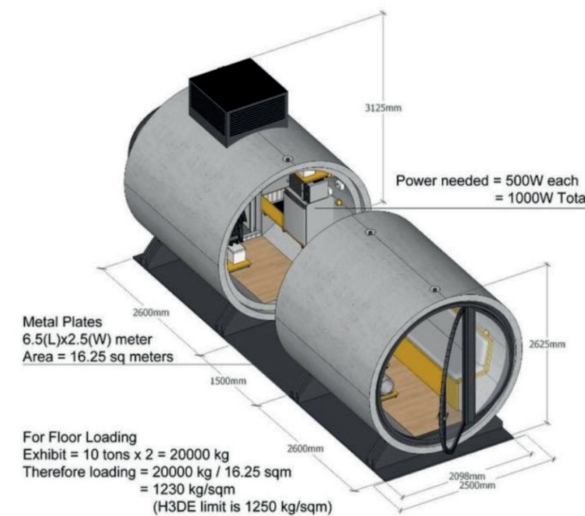
This is an interesting reference because it generates houses from atypical materials, and tries to fight a problem that is not being resolved by governments.

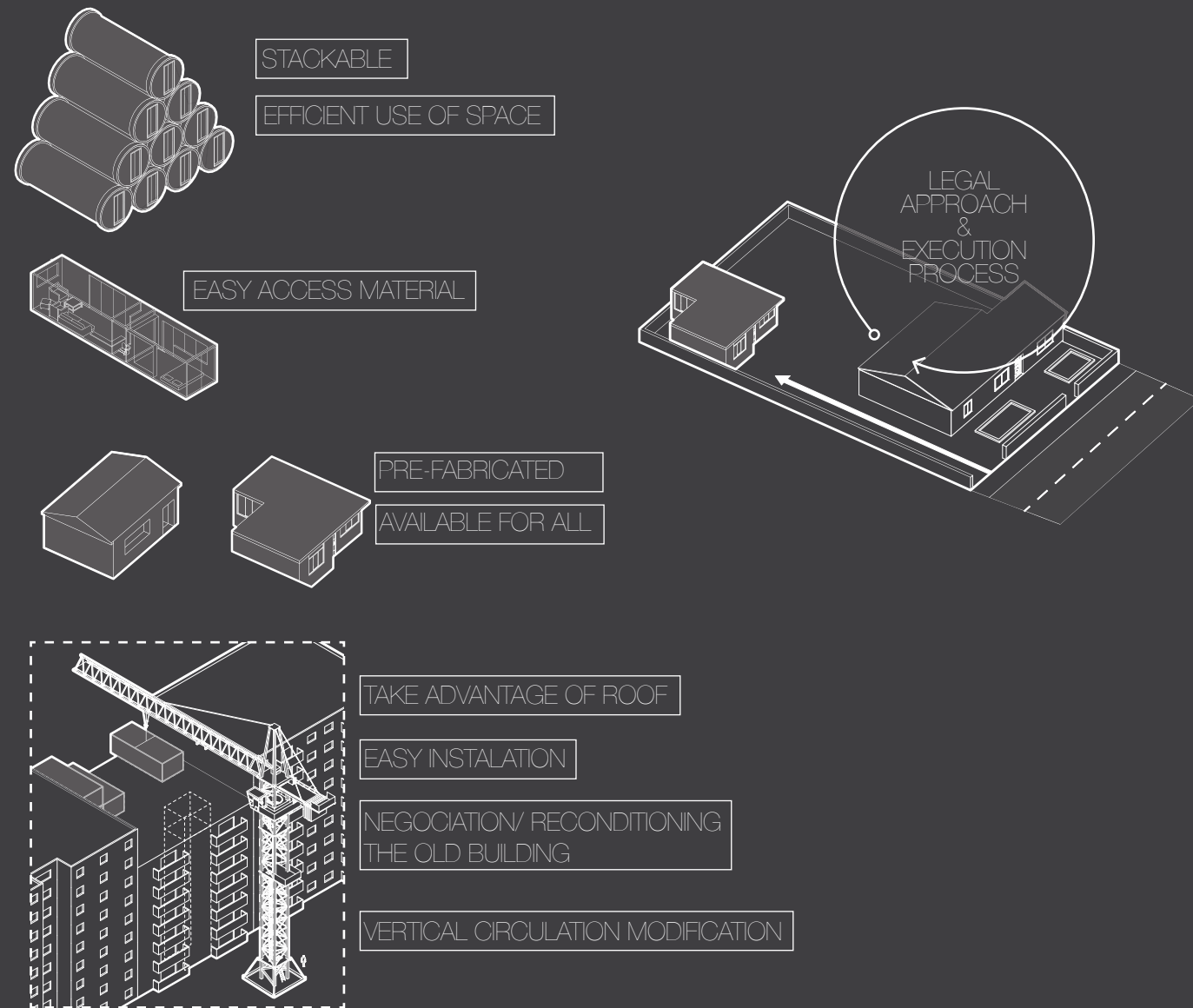


OPODS |

This project consists in the generation of micro homes for the city of Hong Kong. The idea of the designer James Law is to create minimalist homes (for 1-2 people) within a concrete tube normally used for drains. This generates the perfect structure for the shell of the house, and gives particular properties to it. The idea is to create affordable, low-budget housing that can be stacked to create a modular building community in a short time frame.

This proposal is interesting for its search for affordable housing through an atypical material, its ability to generate different uses in such a small space, its ability to stack and its small volume.





CREATE A FLEXIBLE, MOBILE, EASY AND QUICKLY CONSTRUCTION, EASY TO TRANSPORT AND HANDLE, AFFORDABLE PROTOTYPE THAT SERVES AS A SOLUTION FOR THE PROBLEMS RAISED ABOVE. IT WILL SEEK TO CREATE LIVING, OFFICE AND RECREATIONAL SPACES IN ORDER TO IMPROVE THE QUALITY OF LIFE FOR THE INHABITANTS OF SHENZHEN, AND THAT WORKS AS A PARALLEL SOLUTION TO GOVERNMENT PROJECTS.

04 **PROTOTYPE**

CHAPTER FOUR

PROTOTYPE

TYPOLOGICAL SAMPLING



Shenzhen aerial view

In order to study the prototype in question, it was sought to make a study of various types of office spaces in order to analyze their dimensions, façade and core of vertical circulation, and finally take one as an example.



04



04

①

②

③

④

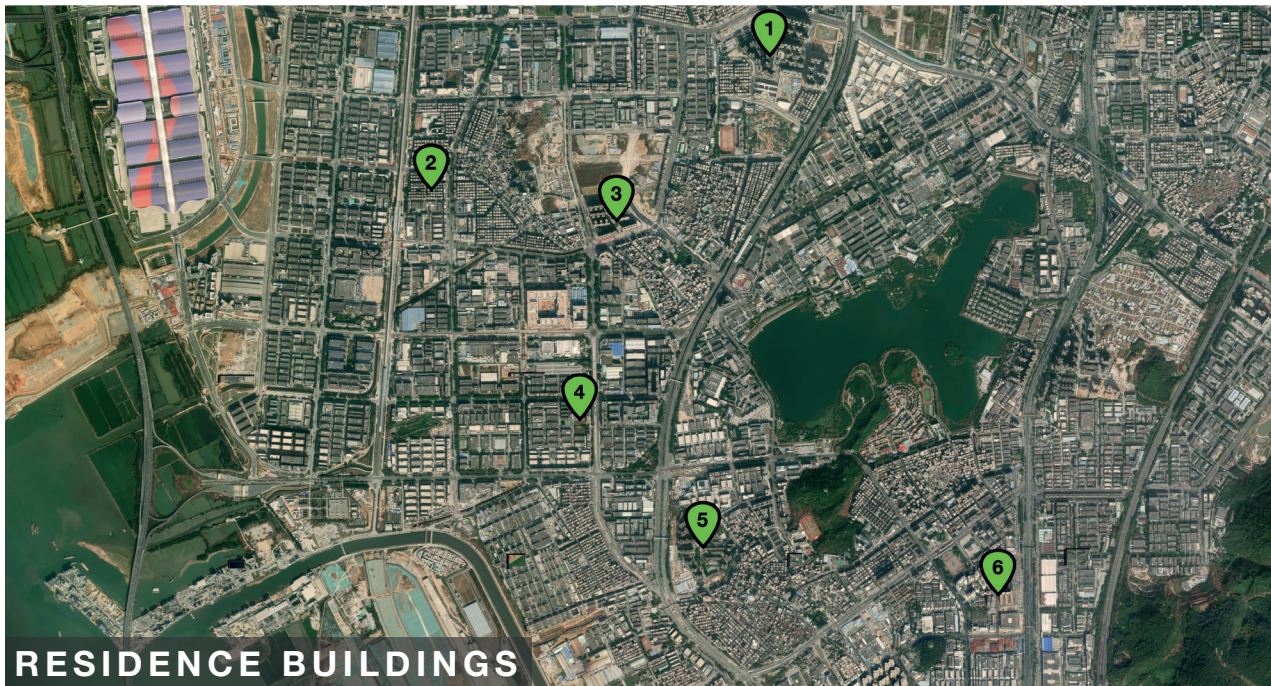
⑤

⑥



PROTOTYPE

TYPOLOGICAL SAMPLING



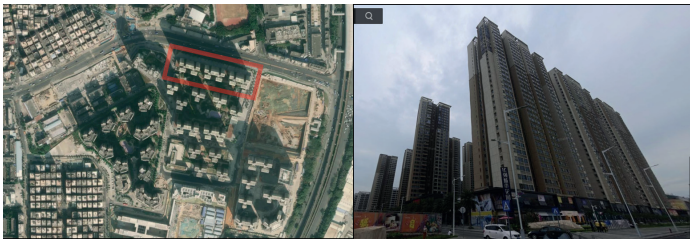
Shenzhen aerial view

RESIDENCE
BUILDING
LOCATION

In order to study the prototype in question, it was sought to make a study of various types of residence buildings in order to analyze the dimensions of their roofs and core of vertical circulation, to finally take one as an example.



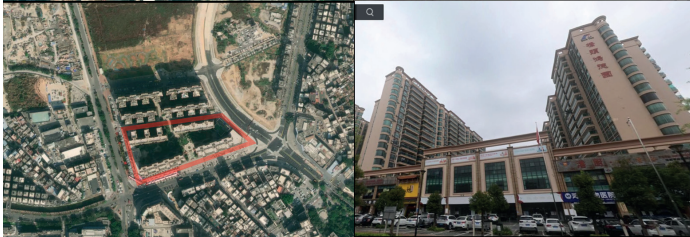
①



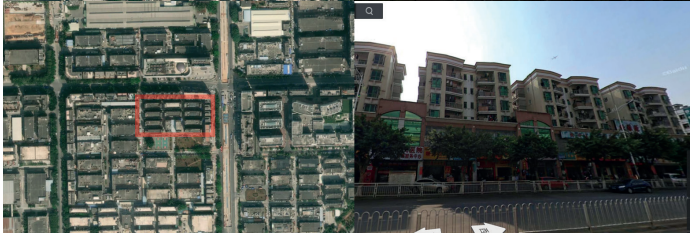
②



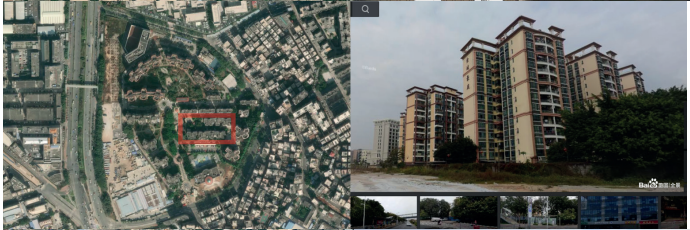
③



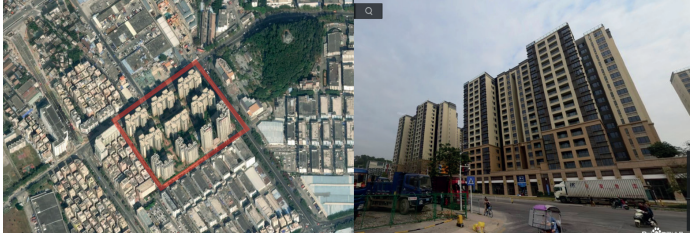
④



⑤



⑥

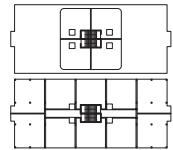
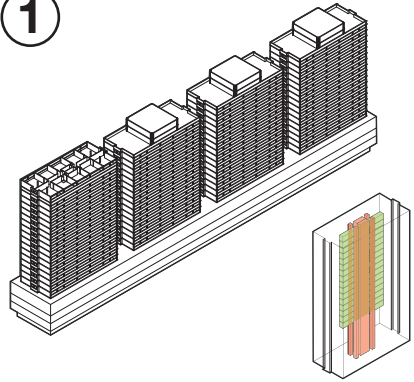


PROTOTYPE

TYOLOGICAL SAMPLING ANALYSIS

OFFICE BUILDINGS

①



Area of floor
728 m²

17 floors

Floor = 728 m²

Circulation = 71 m² = 9,75%(of of floor area)

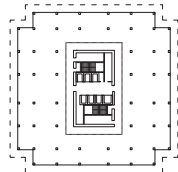
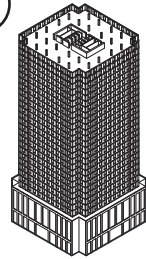
Office space = 728 - 71 = 657m²

t(const)= 657* 17 = 11.169 m²

Possible space for residence usage:

10% of office space= **1.116 m²**

②



Area of floor
1536 m²

25 floors

Floor = 1536 m²

Circulation = 225 m² = 14,64%(of of floor area)

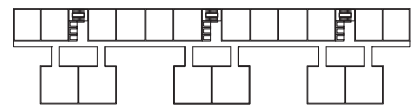
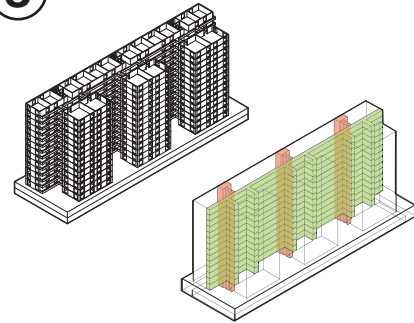
Office space = 1536 - 225 = 1311 m²

t(const)= 1311* 25 = 32.775 m²

Possible space for residence usage:

10% of office space= **3.277 m²**

③



Area of floor
1845 m²

14 floors

Floor = 1845 m²

Circulation = 371 m² = 20%(of of floor area)

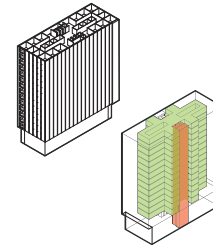
Office space = 1845 - 371 = 1474 m²

t(const)= 1474* 14 = 20.636 m²

Possible space for residence usage:

10% of office space= **2.063 m²**

④



Area of floor
704 m²

14 floors

Floor = 704 m²

Circulation = 160 m² = 22,7%(of of floor area)

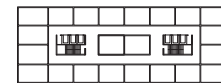
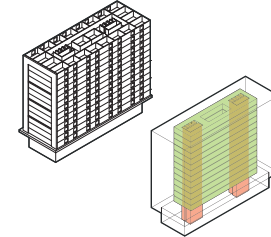
Office space = 704 - 160 = 544m²

t(const)= 544* 14 = 7.616 m²

Possible space for residence usage:

10% of office space= **761 m²**

⑤



Area of floor
1120 m²

13 floors

Floor = 1120 m²

Circulation = 127 m² = 11,33%(of of floor area)

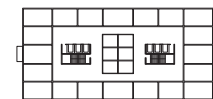
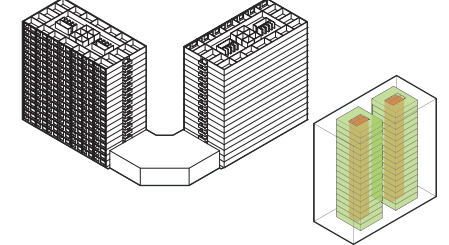
Office space = 1120 - 127 = 993 m²

t(const)= 993* 13 = 12.909 m²

Possible space for residence usage:

10% of office space= **1.290 m²**

⑥



Area of floor
1212 m²

23 floors

Floor = 1212 m²

Circulation = 140 m² = 11,55%(of of floor area)

Office space = 1212 - 140 = 1072 m²

t(const)= 1072* 23 = 24.656 m²

Possible space for residence usage:

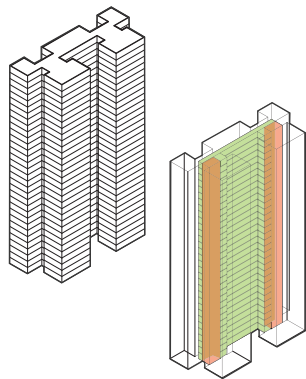
10% of office space=
2.465 m² * 2 buildings = **4.931 m²**

PROTOTYPE

TYOLOGICAL SAMPLING ANALYSIS

RESIDENCE BUILDINGS

①



Area of floor
850 m²

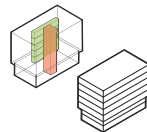
32 floors
Roof: 850 m²
Total construction: 850x32= 27.000
27.000-10% of circulation = 24.300 m²

total(const)/aprox m² per person in china =
24.300/20= 1215 persons

Roof/persons = new space per person

850 m²/1215= **0,699 m²** < 1

②



Area of floor
364 m²

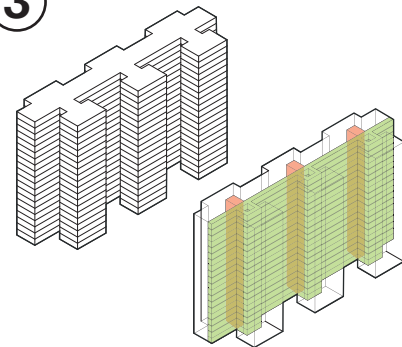
5 floors
Roof: 364 m²
Total construction: 264x5= 1820 m²
1820-10% of circulation = 1638 m²

total(const)/aprox m² per person in china =
1638/20= 81,9 persons

Roof/persons = new space per person

364 m²/81,9 = **4,44 m²** > 1

③



Area of floor
604 m²

17 floors
Roof: 604 m²
Total construction: 604 x17= 10.268 m²
10.268-10% of circulation = 9.241,2 m²

total(const)/aprox m² per person in china =
9.241,2 /20= 462,06 persons

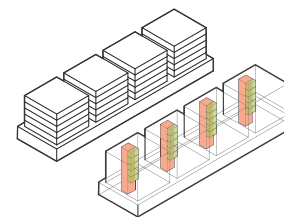
Roof/persons = new space per person

604 m²/462,06 = **1,3 m²** > 1

China approx house measure 60 m²
China approx residential space per capita 20 m²

source: CommSec, RBA, Un, US Census

④



Area of floor
324 m²

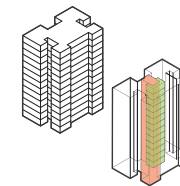
5 floors
Roof: 324 m²
Total construction: 324x5 = 1620
1620-10% of circulation = 1458 m²

total(const)/aprox m² per person in china =
1458/20= 72,9 persons

Roof/persons = new space per person

324 m²/72,9 = **4,44 m²** > 1

⑤



Area of floor
400 m²

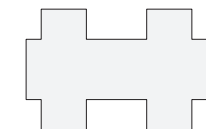
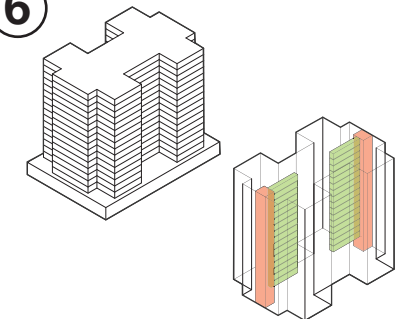
13 floors
Roof: 400 m²
Total construction: 400x13= 5200 m²
5200-10% of circulation = 4680m²

total(const)/aprox m² per person in china =
4680/20= 234 persons

Roof/persons = new space per person

400 m²/234 = **1,70 m²** > 1

⑥



Area of floor
1800 m²

16 floors
Roof: 1800 m²
Total construction: 1800 x16= 28.800 m²
28.800-10% of circulation = 25.920 m²

total(const)/aprox m² per person in china =
25.920 /20= 1296 persons

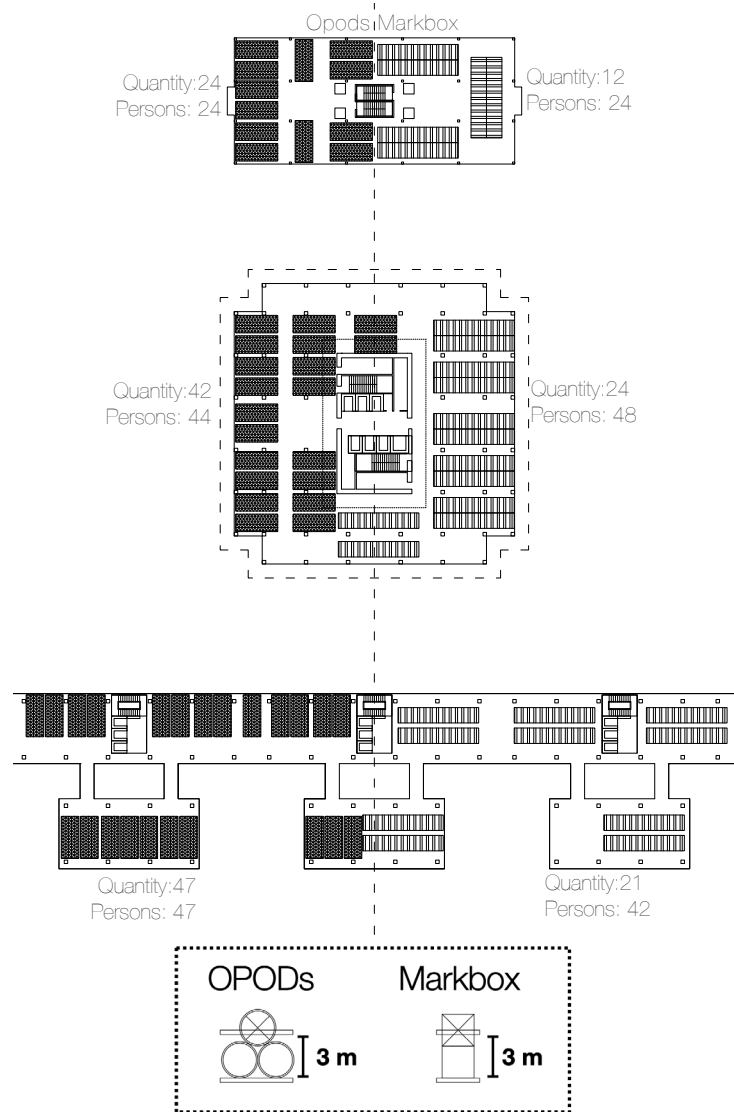
Roof/persons = new space per person

1800 m²/1296 = **1,38 m²** > 1

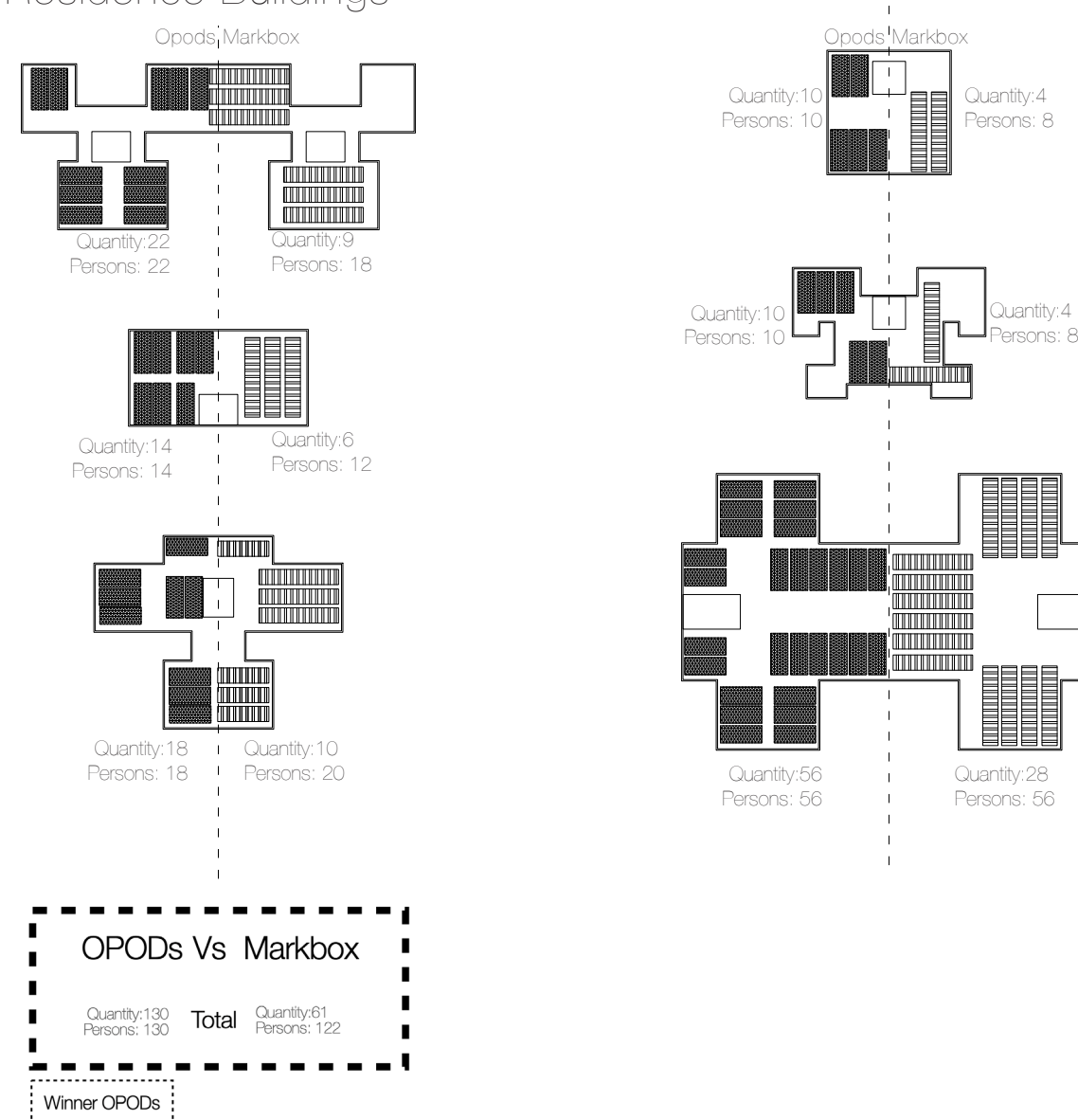
PROTOTYPE

FITTING ANALYSIS OF 2 STUDY CASES

Office Buildings



Residence Buildings



PRO- PO- SAL

CREATE A MODULAR STRUCTURE THAT IS CAPABLE OF GENERATING FLEXIBLE MODULES THAT SERVE AS A SOLUTION FOR AFFORDABLE HOUSES AND HOME WORKING. THE **A F F O R D A B L E H O U S I N G** ISSUE WILL BE ADDRESSED WITH THE GENERATION OF HOUSES INSIDE THE EMPTY OFFICE SPACES. THESE WITH THE INTENTION OF GIVING A POSSIBILITY TO THE OWNERS OF THE OFFICES TO GENERATE INCOME AND TO THE CITY TO IMPROVE THE HOUSING PROBLEMS. IN THE CASE OF **H O M E W O R K I N G**, SUITABLE WORKING SPACES WILL BE GENERATED ON THE CEILINGS OF RESIDENTIAL BUILDINGS, IN ORDER TO IMPROVE THE QUALITY OF LIFE OF THE INHABITANTS OF SHENZHEN, WHERE MOST LIVE IN VERY SMALL SPACES.

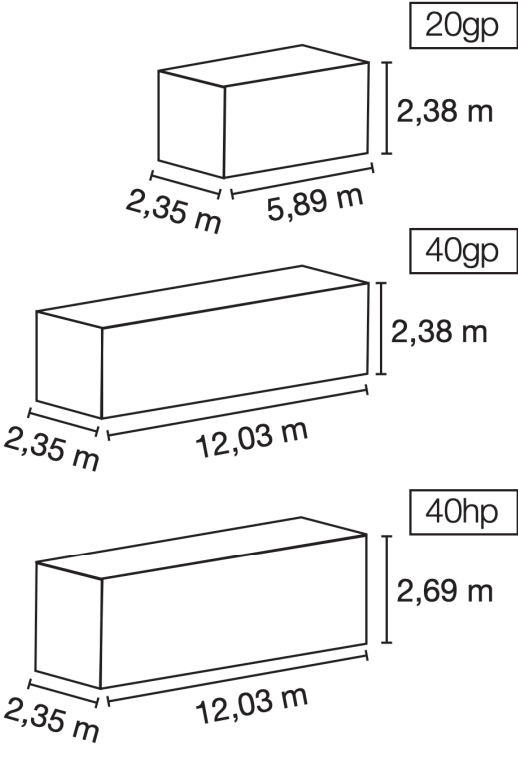


PROTOTYPE

MATERIAL ANALYSIS

04

CONTAINER NORMAL MEASURES



CONTAINER 40hq
PRICE
950 \$



CONTAINER 20gp/20hq/40hq
PRICE
1000 \$



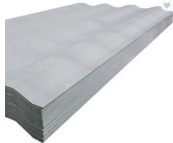
PRE-FAB CABIN
PRICE
1700 \$



PRE-FAB HOUSE
PRICE
1780 \$



PRE-FAB HOUSE PORTABLE CABIN
PRICE
1780 \$



CONTAINER CORRUGATED WALL SHEET (1,1 m X 2,4m)
PRICE
25 \$/PIECE



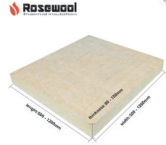
ALUMINIUM EXTRUSION PROFILE
PRICE
2,02 \$/m



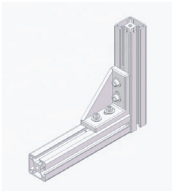
STAINLESS STEEL DOOR
PRICE
65 \$/PIECE



ALUMINIUM WINDOW
PRICE
120 \$/PIECE



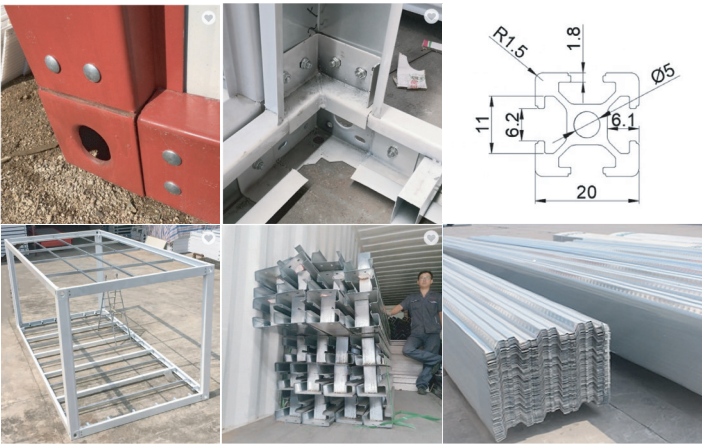
ROCK WOOL THERMAL ISOLATION (1,2 m x 1,2 m)
PRICE
3,25 \$/PIECE



ALUMINIUM EXTRUSION PROFILE 90° JOINT
PRICE
1,50 \$/PIECE



HEAVY DUTY CASTER WHEELS FOR CONTAINERS
PRICE
5 \$/PIECE



prices source: alibaba.com



04



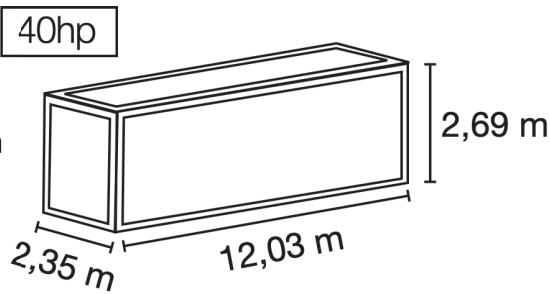
PROTOTYPE

ENVELOPE COST FEASIBILITY

1. Steel frame

$(12\text{m} \times 4) + (2,35\text{m} \times 4) + (2,69\text{m} \times 4) = 68,16 \text{ m}$

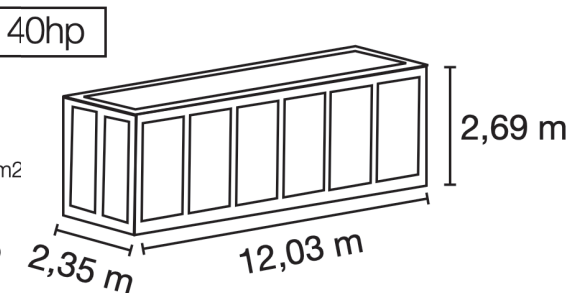
$68,16 \text{ m} \times 2.02\$ (\text{per m}) = \mathbf{137,68 \$}$



2. Side panels

$\text{Surface area} = (12\text{m} \times 2,69\text{m} \times 4) + (2,35\text{m} \times 2,69\text{m} \times 2) = 142,17 \text{ m}^2$

$142,17 \text{ m}^2 / 2,66 \text{ m}^2 \times 25\$ = \mathbf{1336,18 \$}$



3. Total

New one

$137,68 \$ + 1336,18 \$ = \mathbf{1473,86 \$}$

+ 32,11 %

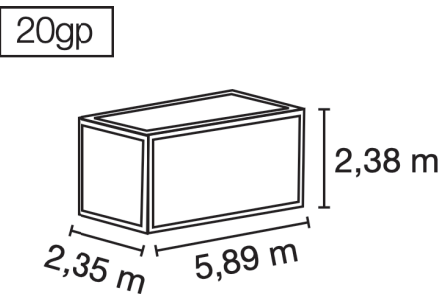
Old one

1000 \$ - 900 \$

1. Steel frame

$(5,89 \text{ m} \times 4) + (2,35\text{m} \times 4) + (2,38 \text{ m} \times 4) = 42,48 \text{ m}$

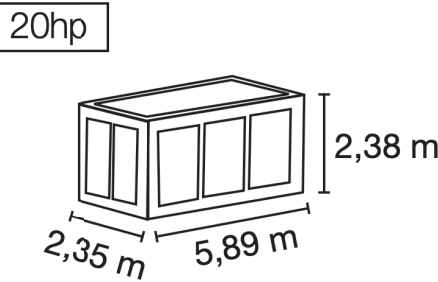
$42,48 \text{ m} \times 2.02\$ (\text{per m}) = \mathbf{85,80 \$}$



2. Side panels

$\text{Surface area} = (5,89 \text{ m} \times 2,38 \text{ m} \times 4) + (2,35\text{m} \times 2,38\text{m} \times 2) = 67,25 \text{ m}^2$

$67,25 \text{ m}^2 / 2,66 \text{ m}^2 \times 25\$ = \mathbf{632,04 \$}$



3. Total

New one

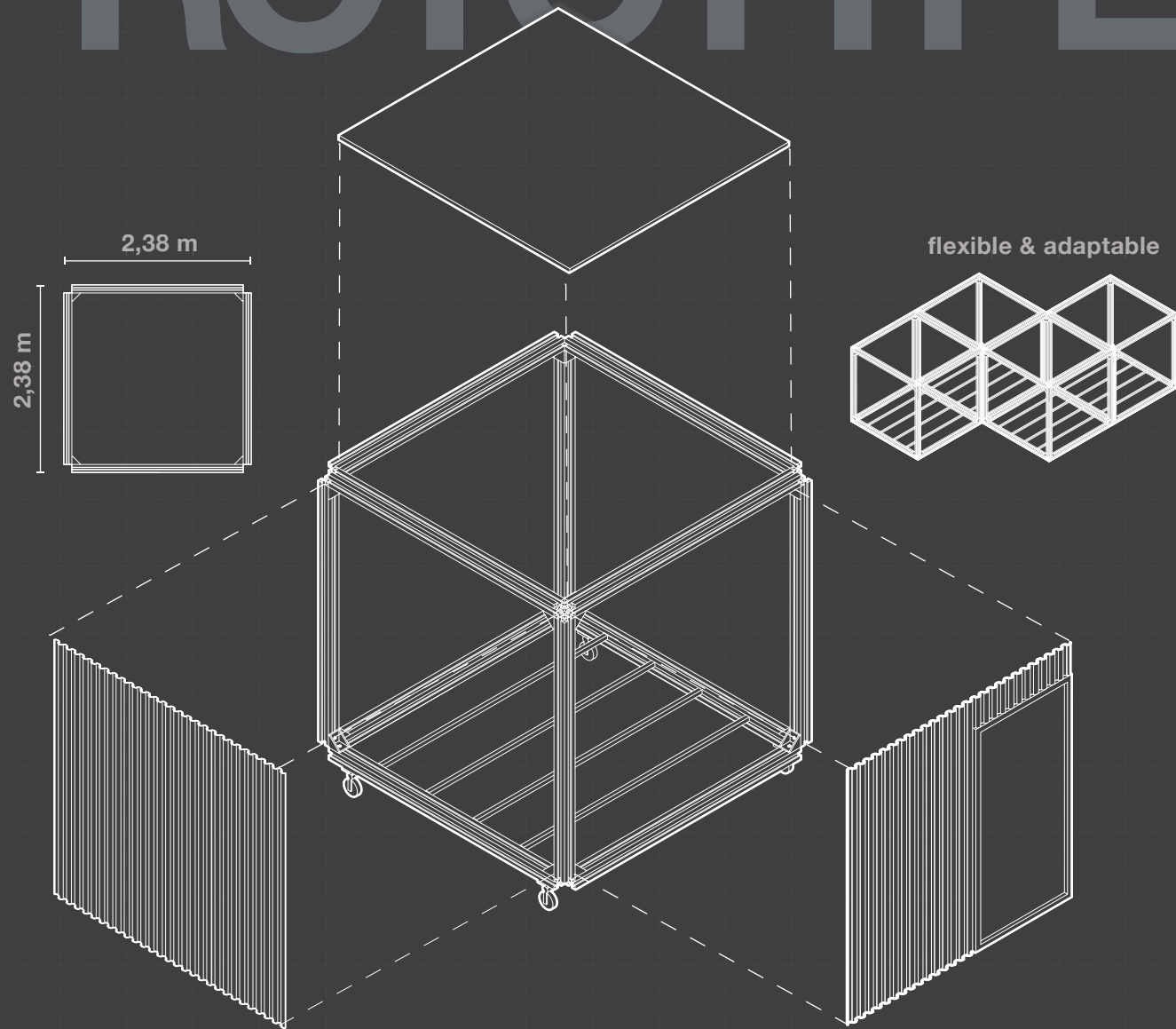
$85,80 \$ + 632,04 \$ = \mathbf{717,84 \$}$

- 24,43 %

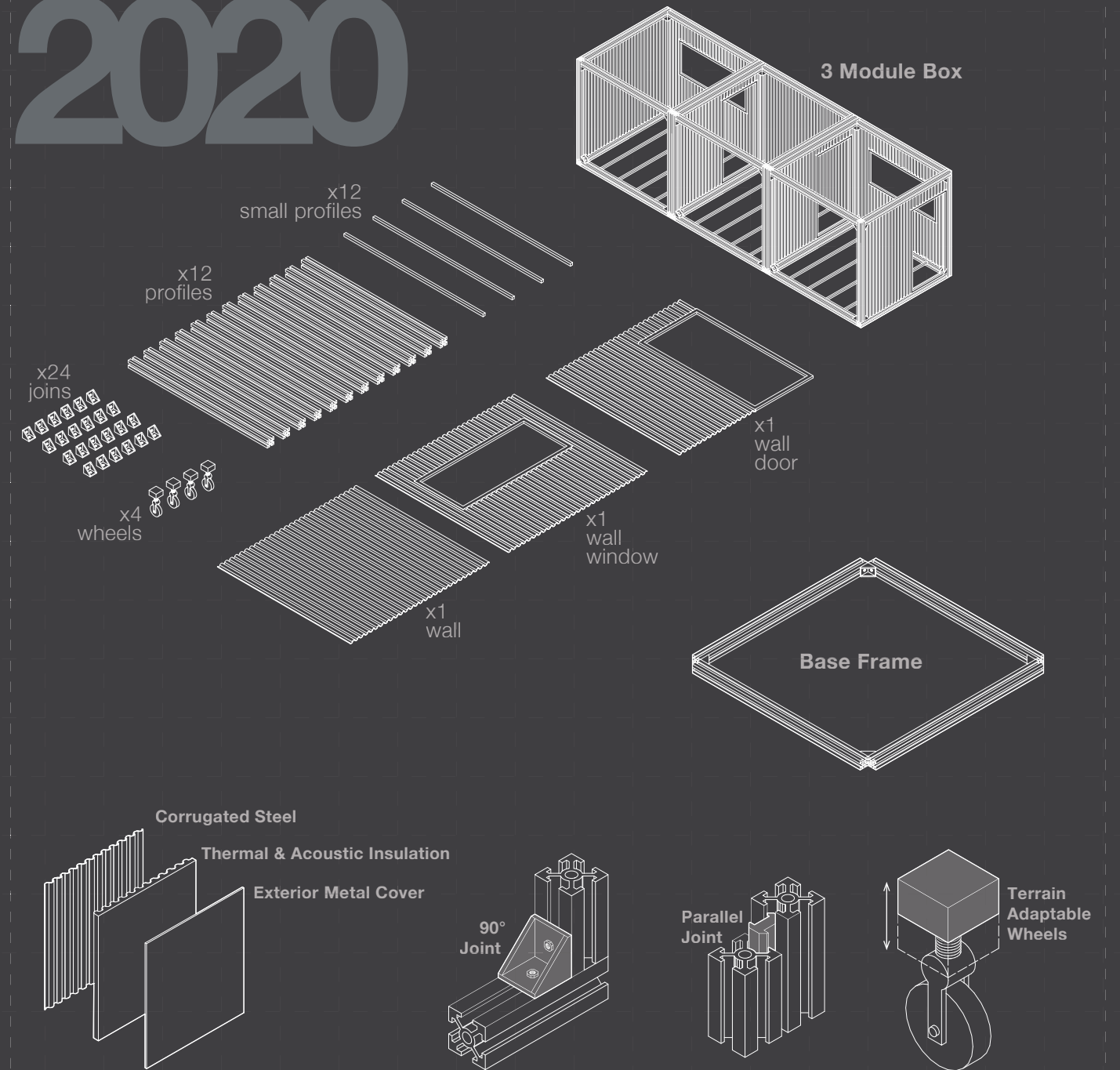
Old one

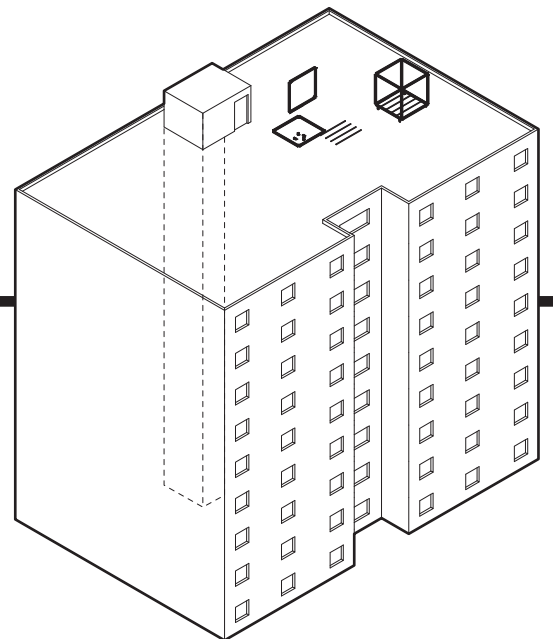
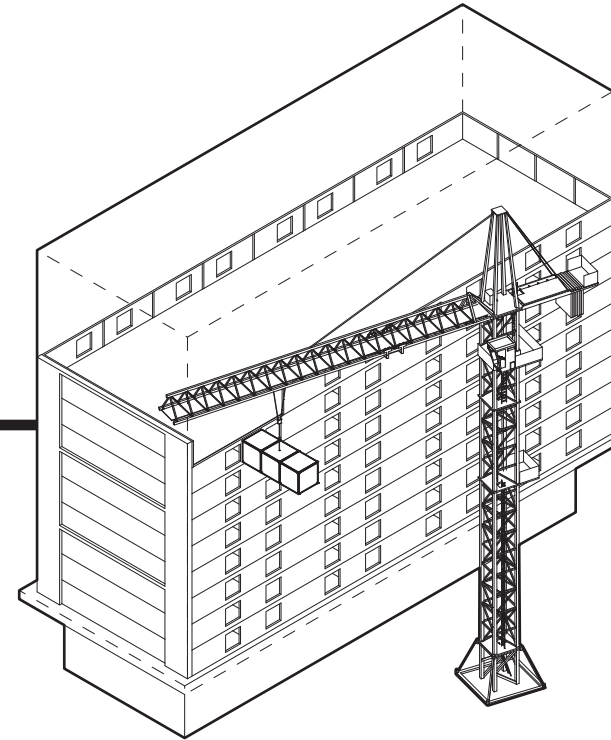
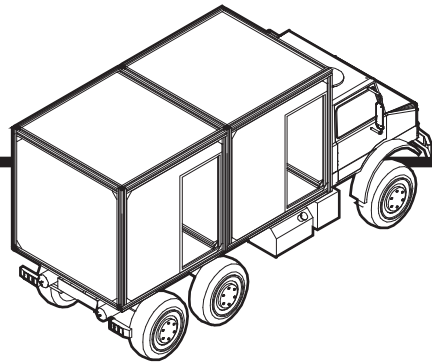
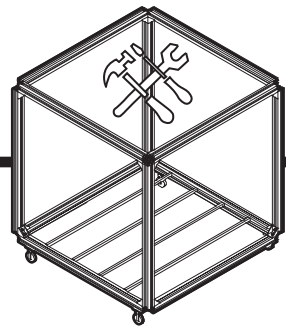
950 \$ - 850 \$

PROTOTYPE



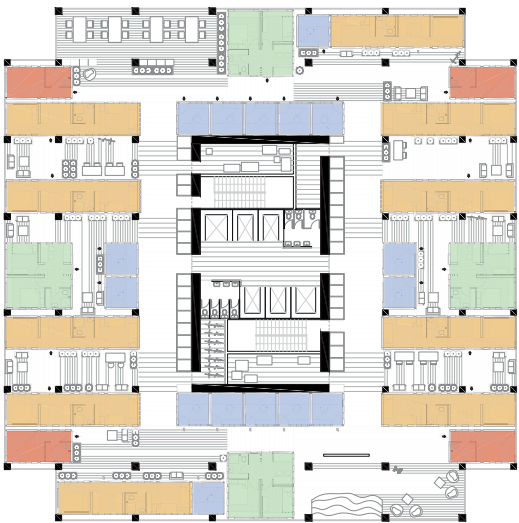
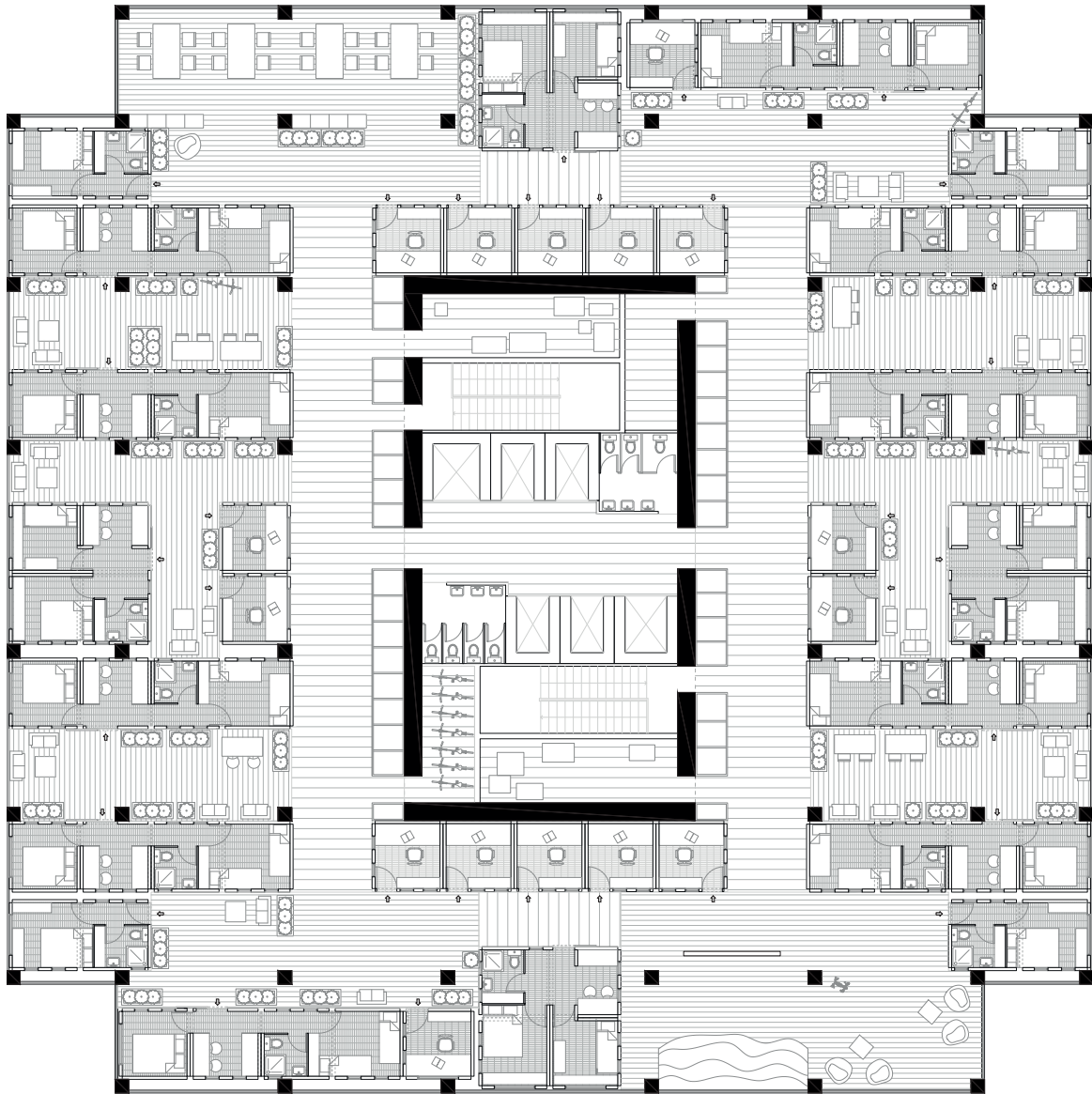
2020





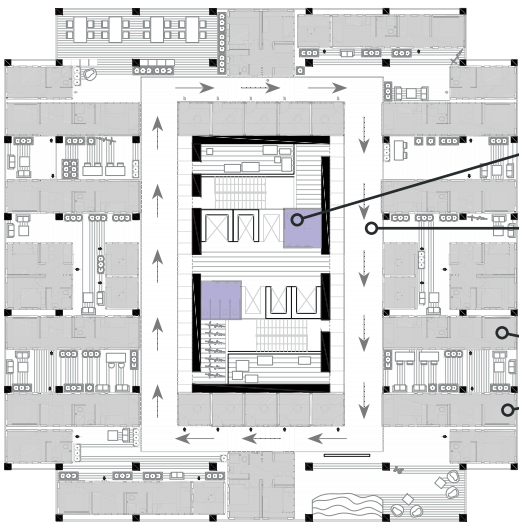
PROTOTYPE

OFFICE BUILDING IMPLEMENTATION EXAMPLE



- 1-2 apt. Studio X4
- 4 persons apt. X 10
- 4 persons apt. X 4
- Office X18

Total apt.	18
Total persons	64
Total Offices	18

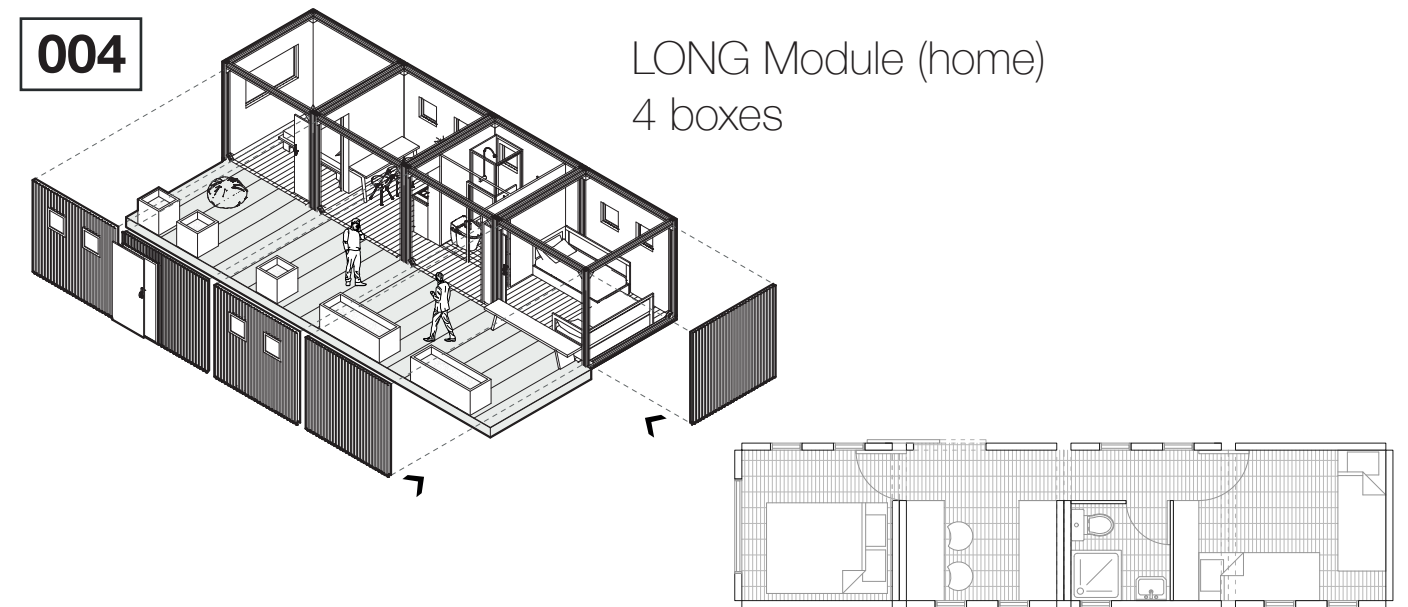
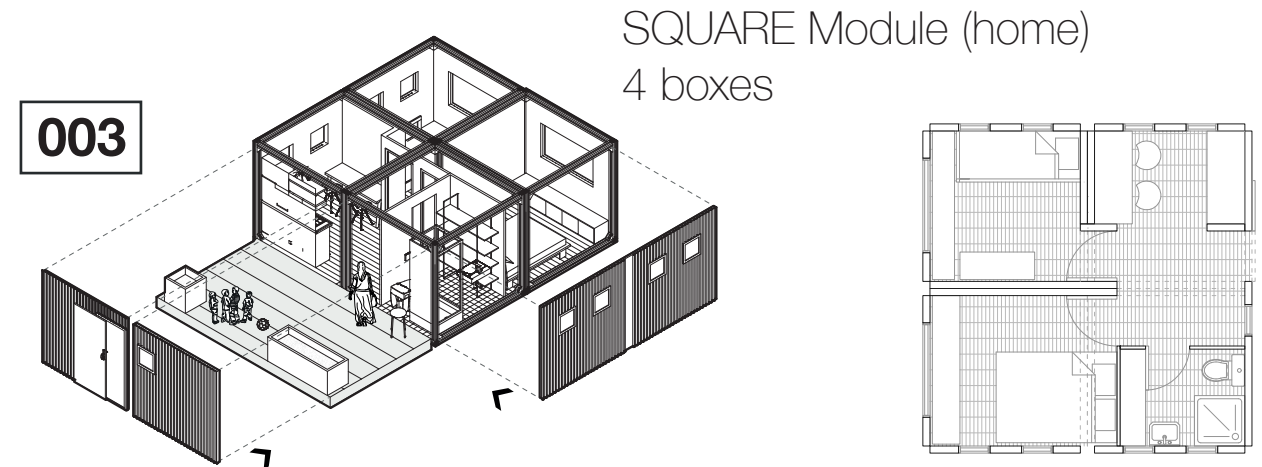
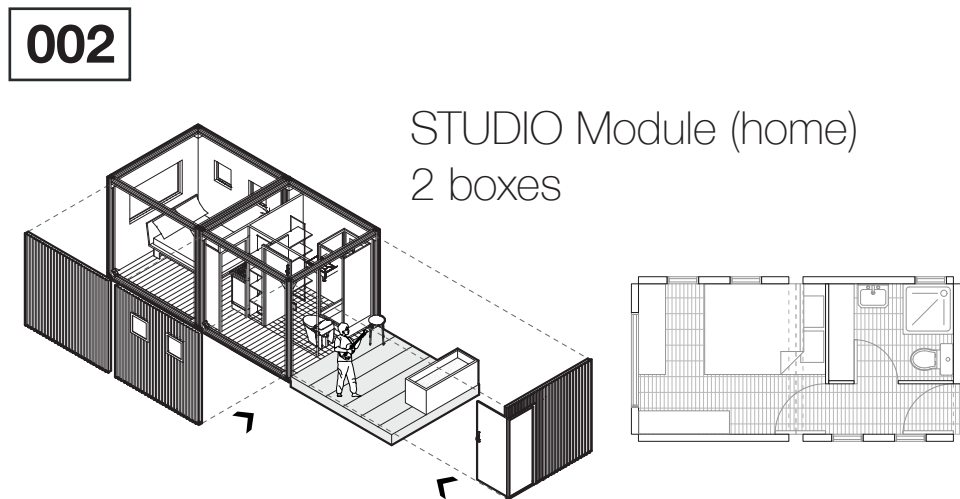
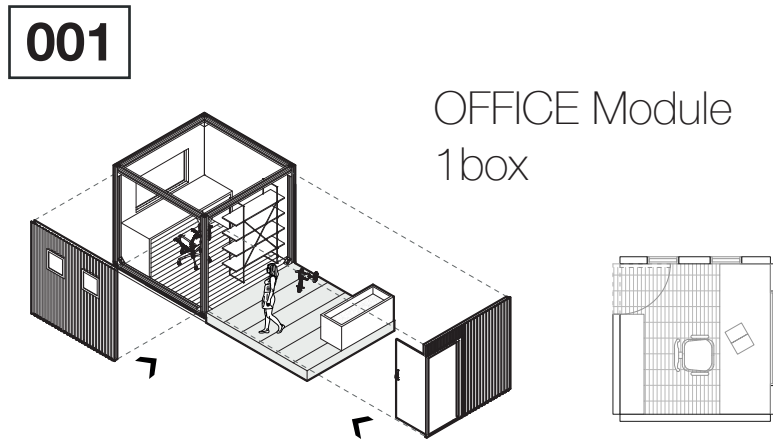


- Sanitation Rooms
- One Way Circulation
- Capsules Division
- Natural Ventilation and Illumination

PROTOTYPE

INTERNAL MODULES

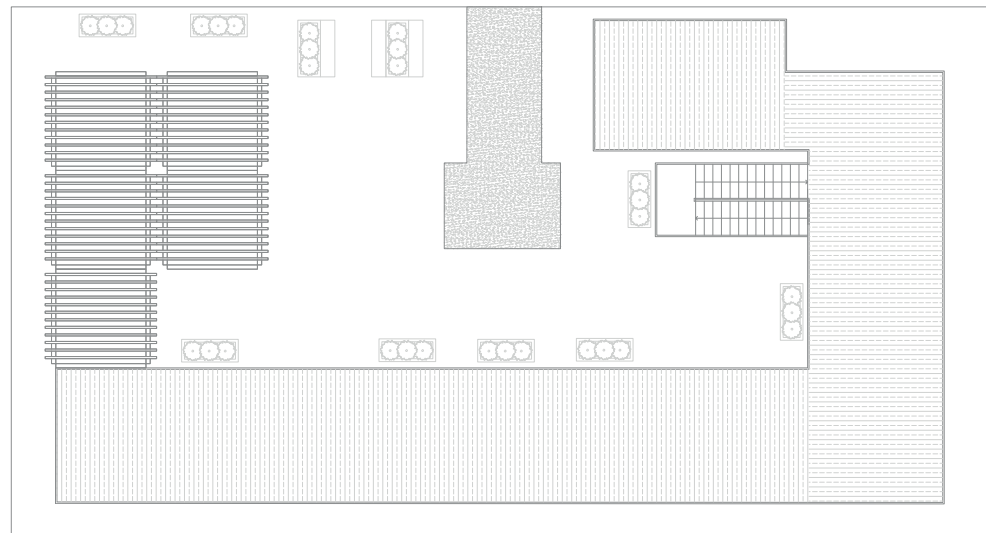
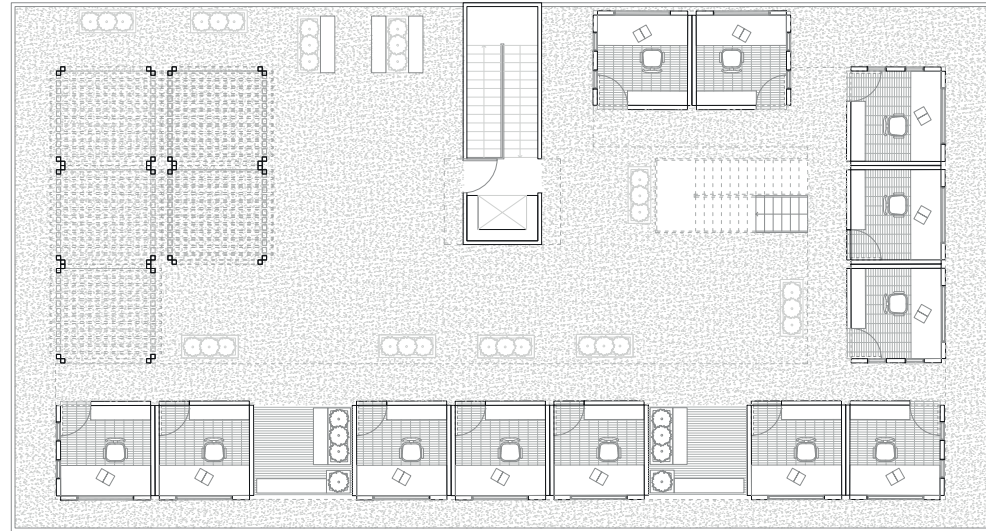
04



04

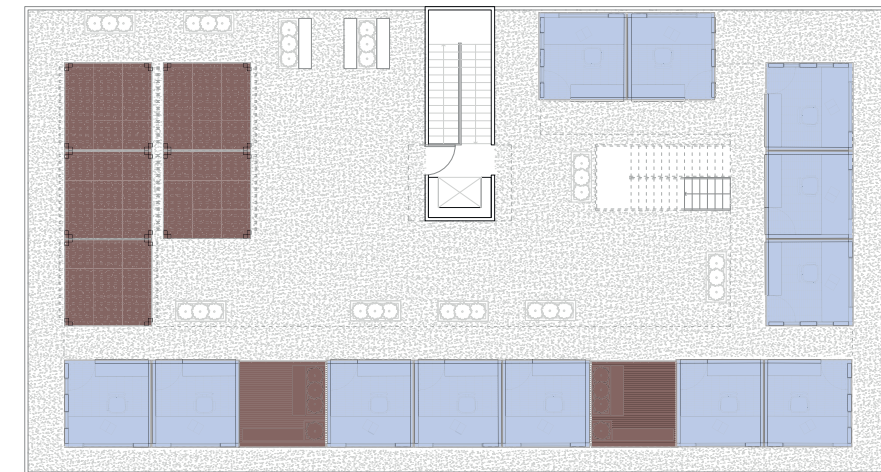
PROTOTYPE

RESIDENCE ROOF IMPLEMENTATION EXAMPLE

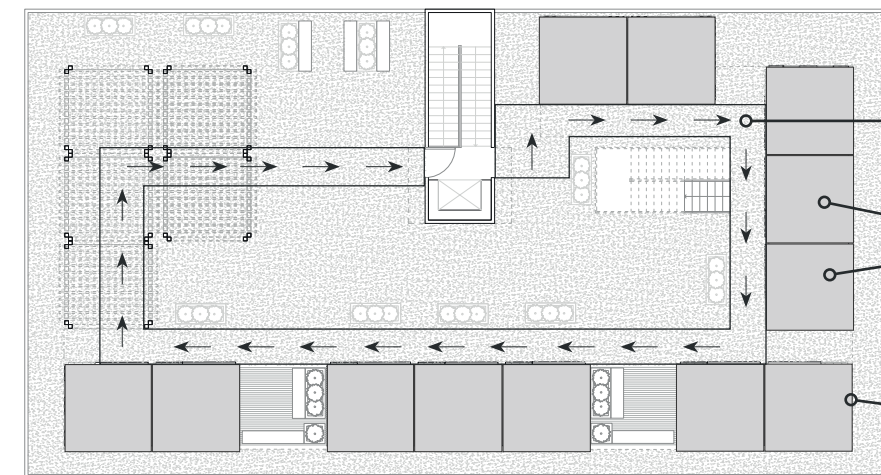


04

04



- Leisure Boxes X 7
- Office X12



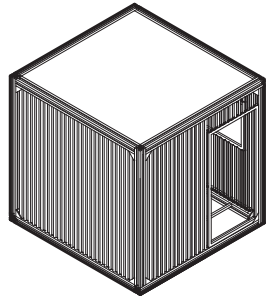
- One Way Circulation
- Capsules Division
- Natural Ventilation and Illumination



PROTOTYPE

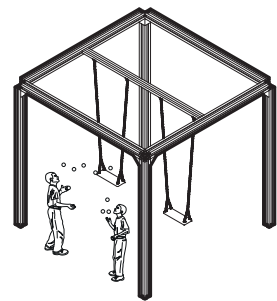
EXTERIOR MODULES

005



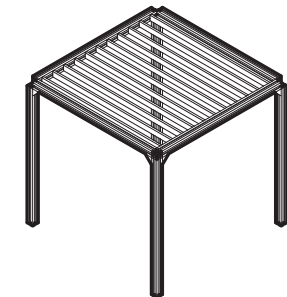
OFFICE EXTERNAL Module
1box

006



CHILDREN SWING Module
1box

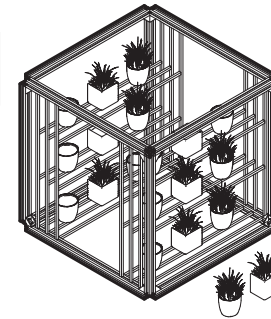
007



SUN PROTECTOR Module
1box

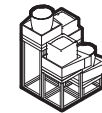
04

008



URBAN GARDEN Module
1box

009



PLANT POTS Module
1box

010



GREEN ROOF Module
1box

04

PROTOTYPE

AFFORDABILITY APPROXIMATION

The following analysis represents an approximate cost of materials for the following modules. These do not represent final costs, having to add external expenses of taxes, fees, transportation, among others.

PRICE LIST:

- Main Profiles = **2,02 \$/m**
- Secondary Profiles = **1,20\$/m**
- Corrugated panels (2,10 cm x 1,10cm) = **25 \$/piece**
- Rock Whool Insulation (1,20 m x 1,20 m)= **3,25 \$/piece**
- Floor Panel PVC = **3,10 \$/m2**
- 90° Joins = **1,50 \$/piece**
- Wheels = **20 \$/piece**
- Window = **120 \$/piece**
- Door = **65 \$/piece**
- Economic Toilet = **28 \$/piece**
- Economic Handwash = **11 \$/piece**
- Economic Shower = **26 \$/piece**

- Manufacturing labor (+ or -) **10%**

04

001

OFFICE Module
1box = **641,46 \$**

002

STUDIO Module (home)
2 boxes = **1397,83 \$**

003

SQUARE Module (home)
4 boxes = **2257,6 \$**

004

LONG Module (home)
4 boxes = **2224,6 \$**

005

OFFICE EXTERNAL Module
1box = **682,15 \$**

006

CHILDREN SWING Module
1box = **63,45 \$**

007

SUN PROTECTOR Module
1box = **68,40 \$**

008

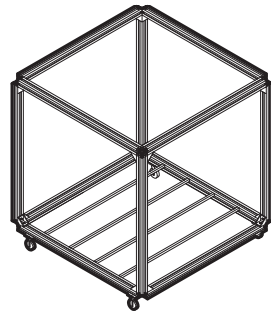
URBAN GARDEN Module
1box = **108,6 \$**

009

PLANT POTS Module
1box = **8 \$**

010

GREEN ROOF Module
1box = **75,4 \$**



1 box cost est.
146,15 \$

04



05 POSITIONING THE PROJECT

CHAPTER FIVE



STAKEHOLDERS

INTRODUCTION

The analysis presented below deals with a fictitious assumption that is generated with the intention of studying the possible actors involved and creating a hypothesis of their behavior with respect to the project in execution. This in order to generate phases that will describe the suitable way of executing the process.

The following actors were taken from official lists of the Shenzhen government, and will be divided into categories by interest and role with respect to the project.



STAKEHOLDERS

DIVISION BY / INTEREST

05

Political Actors

Government of China

Shenzhen City Government

District Government

Bureaucratic Actors

Housing Provident Fund Management Center of Shenzhen Municipality
(it formulates local regulations, rules and specific management methods for housing funds)

Housing and Construction Bureau of Shenzhen Municipality
(it implements plans for affordable housing; it advances housing system reform and affordable housing construction)

Urban Planning, Land & Resources Commission of Shenzhen Municipality
(responsible of the city masterplans design, special plans and urban regulations in Shenzhen)

Development and Reform Commission of Shenzhen Municipality
(it integrates and balance urban master plan, land use master plan and urban living environment plan; it coordinates issues arising from law and policies implementation)

General Interests Actors

NGO (Promoter of the project)

Special Interests Actors

Clients (People of Shenzhen)

Steel companies

Doors and windows companies
(profiles, windows, doors etc)

Transportation and assembly companies

Builders and specialized workers



STAKEHOLDERS

DIVISION BY / ROLE

05

The Promoter

(who brings the problem to attention and proposes a solution)

NGO - Non Governmental Organization

The Fixer

(who guides the project from the beginning to the end)

Shenzhen government

District government

Shenzhen Center for Design

Architecture firm

Housing and Construction Bureau of Shenzhen Municipality

The Opponent

(who tries to prevent the transformation to take place)

Construction Companies (e.g. Shenzhen Ninefold Construction Group)

Shared Workspace Companies (e.g. WeWork)

Neighbors (in office buildings areas)

The Ally

(who supports the transformation and its objectives)

Property owner

Housing Provident Fund Management Center of Shenzhen Municipality

The Mediator

(who mediates possible conflicts among actors)

Development and Reform Commission of Shenzhen Municipality

The Gatekeeper

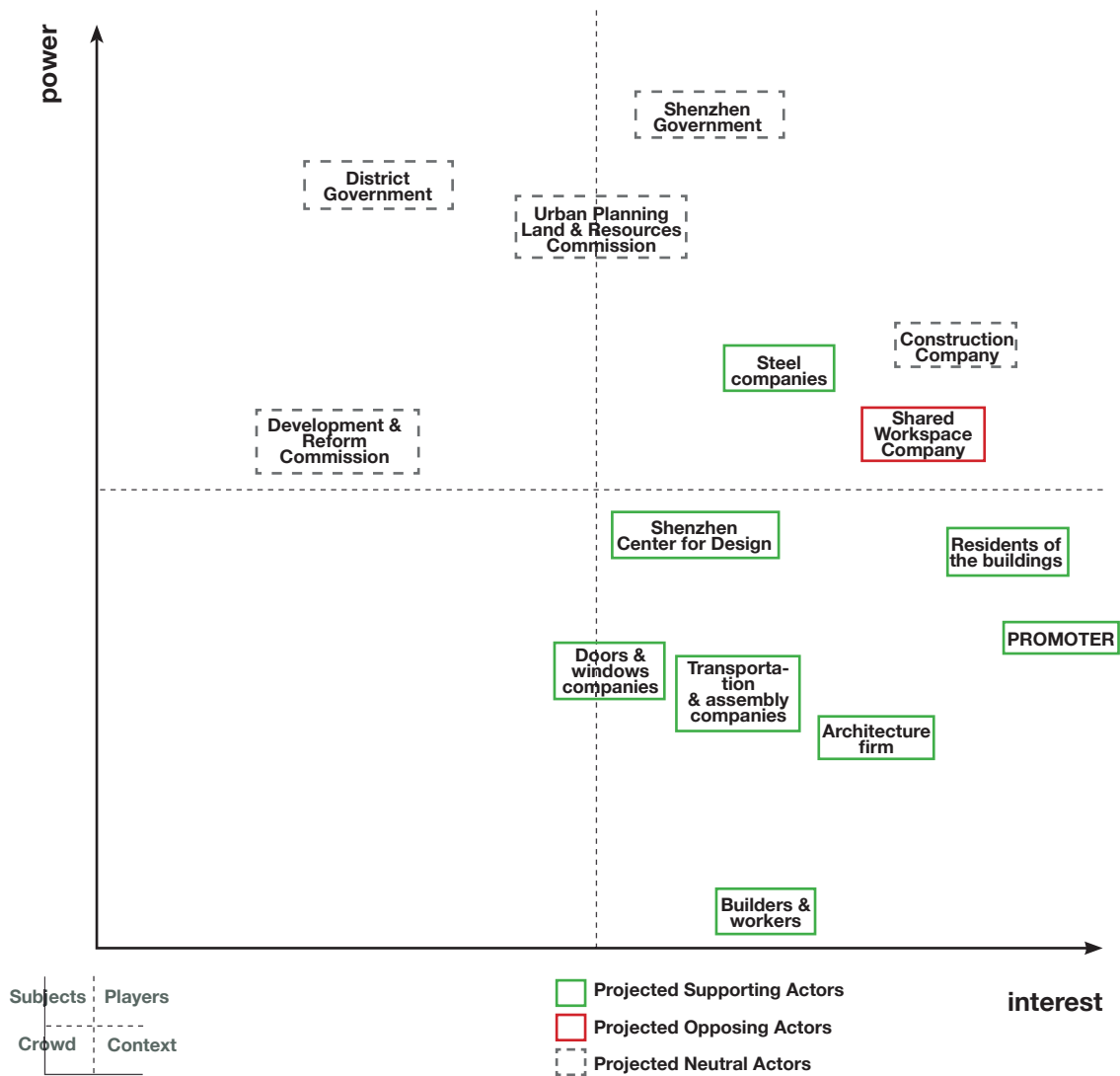
(who obstructs the transformation)

Urban Planning, Land & Resources Commission of Shenzhen Municipality



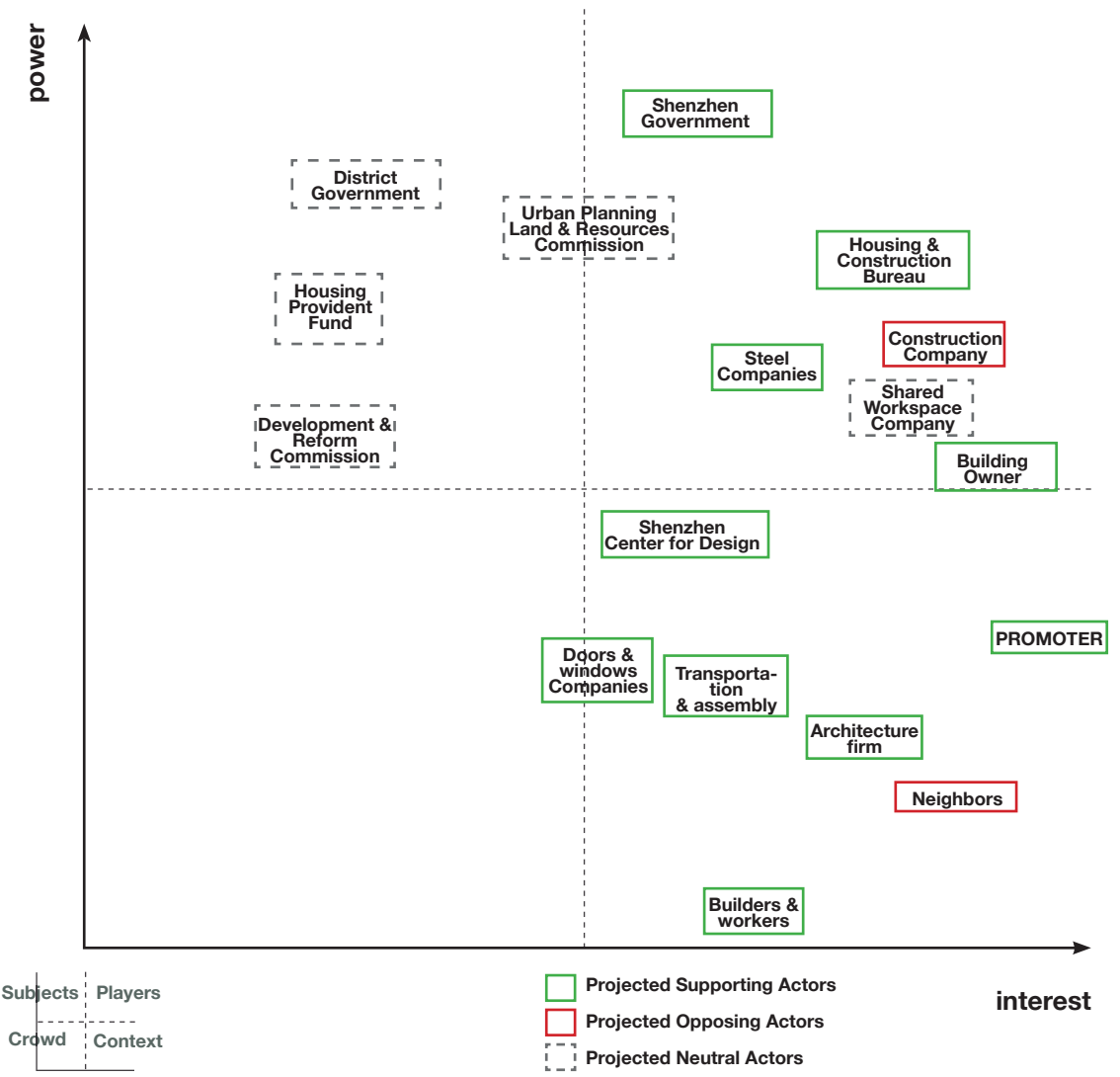
STAKEHOLDERS

POWER - INTEREST GRID RESIDENTIAL BUILDING CASE



STAKEHOLDERS

POWER - INTEREST GRID OFFICE BUILDING CASE

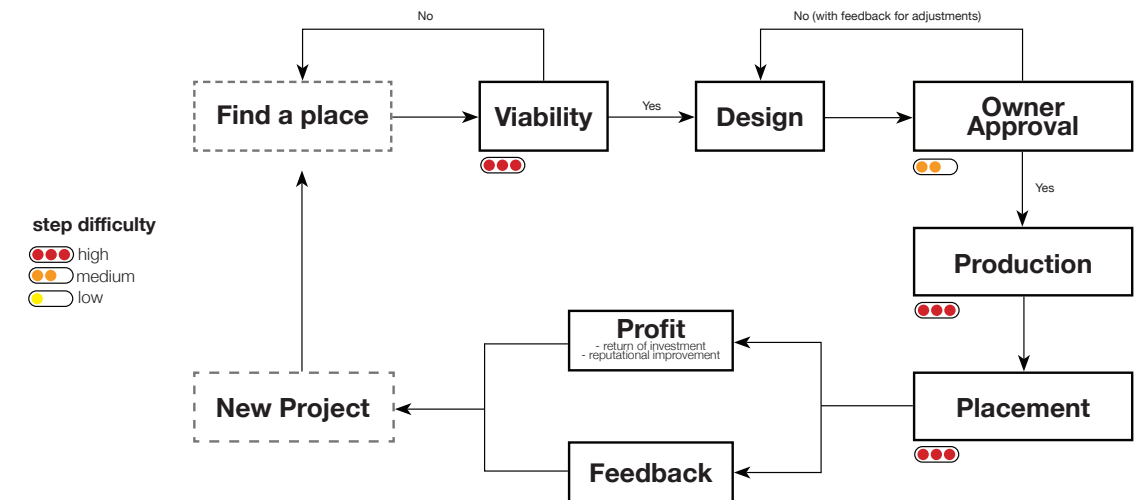


Having defined the actors in question and their possible behaviors with respect to the project, we seek to generate a detailed description of the processes to follow in order to make the idea come true. These were divided into 3 phases seeking to explain the difficult stages of the project, where more effort is needed from the promoter at the beginning and almost nothing at the end, when the project begins to walk alone. These three phases are called, **IMPACTING**, **DEVELOPING** and **SPREADING** and represent the different cycles through which the process will go through on its way to become a real solution for the city of Shenzhen.

PHASE 1

IMPACTING 

prototype affordability:
low



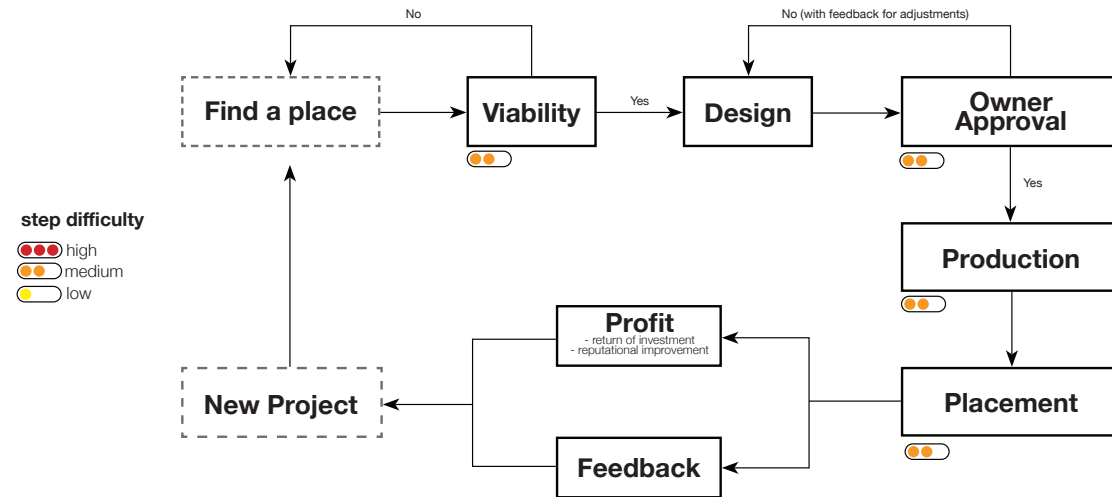
The project impacts Shenzhen thanks to the promoter's interest and intention in finding buildings, residential and offices, where the prototype can be used to build working or living units. The project must face political, economic and structural regulations before being approved and pass onto the design phase; the latter brings space improvement and its final approval, comes from the buildings' owners allowing the project to eventually take place. The following step of production, in the impacting phase, requires a market research carried out mainly by the promoter and the

allies, to find materials producers and workers. The following prototype placement necessitates a preliminary study on the existing building in order to find the best approach for the instalment, dependign on the size and quality of the vertical circulation it might involve a crane company. The resulting profit, monetary and reputational, augments the interest of new possible actors towards the project; and the feedback from finished works contributes to the improvement of both the quality of the prototype and the policies regulating the whole intervention.

PHASE 2

DEVELOPING 

prototype affordability:
medium



The developing phase is enabled by new promoters stronger on political and economic levels (like the Housing Provident Fund Management Center), the involvement of such allies transfers the project on a more realistic and bigger scale, and it also eases the viability when confronting urban or structural restrictions. As phase one, the design step is verified and approved by the buildings' owners; the following production step eases by involving more figures and experts into the research of materials producers. As previously, the prototype placement necessitates a building-level study to

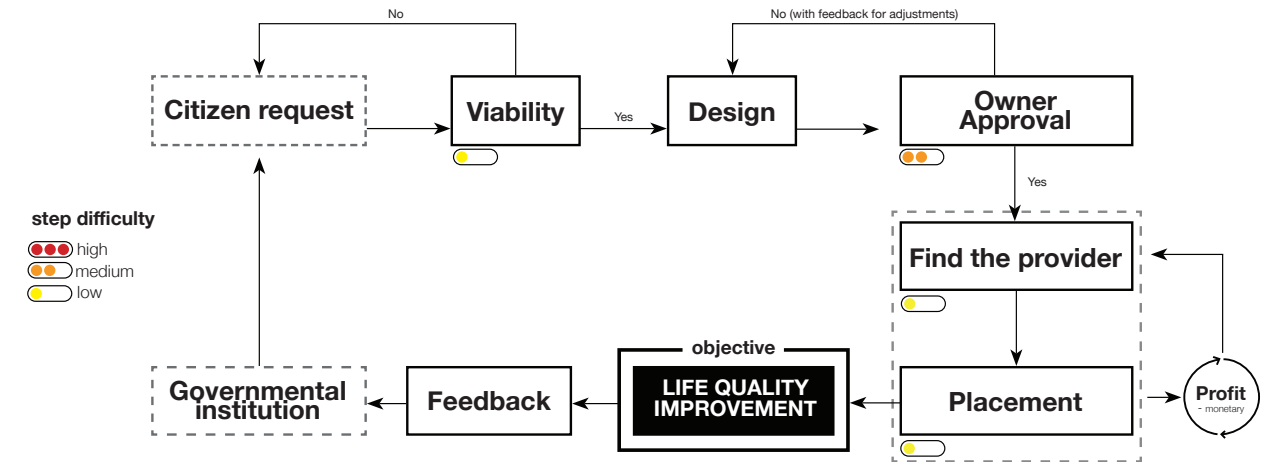
develop an intervention program. Profits and feedbacks remain an essential step in order to improve the product and smoothen out the process, and enabling the city to enter phase 3.



PHASE 3

SPREADING 

prototype affordability:
high



After the early and mid phases, Shenzhen citizens rise the prototype demand and the latter starts spreading as a common practice, in which political figures naturally become the promoters. The market establishment of the idea, makes it more affordable and potentially sold in various forms (assembled, pieced) by newborn companies who are focused exclusively on the prototypes production, and who gradually faces more competition, providing a prototypes gradually more affordable.

The designer figures might also become part of the latter companies who, after the owners' approval, could also include the placement intervention as a service done by them.

The project reaches its main objective improving the life quality of Shenzhen citizens; while the final feedback serves mainly the governmental institutions who might continue to improve regulations on the construction of affordable housing and work spaces through the prototype use.



CONCLUSION

The problem about housing is something that has been for a while in the city of Shenzhen and its exponential growth in all areas makes it increasingly difficult to handle. Affordable housing is an issue that affects all social levels of the city by lowering the spatial quality to which each person can afford. This linked to the covid 19 issue presents a great challenge for the inhabitants of Shenzhen, as they have low-quality housing spaces.

This problem is something that worsens year after year, and that the government tries to improve, but with insufficient results. Therefore, solutions of another nature must be implemented to improve the figures.

Projects such as the 2020 Prototype generate one of those possible solutions, proposing to generate a snowball that involves many actors in the process and not only the government. Creating a lateral interoperability solution, where anyone in the city can participate, opens up a range of possibilities to improve diverse problematic issues in the city.

In conclusion Shenzhen is a city that being a SEZ, maintains an accelerated growth, and therefore they must find accelerated solutions. These solutions must be of great impact and scope; ambitious and creative; since, in this way they will be able to achieve the future that awaits them.



BIBLIOGRAPHY

Al S., (2014) “Villages in the City: A Guide to South China’s Informal Settlements”, Hong Kong University Press

Du J., (2020) “The Shenzhen Experiment: the story of China’s instant city”, Harvard University Press

AlTakarli N. S., (2020) “China’s Response to the COVID-19 Outbreak: A Model for Epidemic Preparedness and Management”, Dubai Medical Journey

Bulanda-Jansen A., (2019) “Evolution of The Metropolitan Area of Shenzhen, Analysis: From Theory to Selected Examples”, IOP Conf. Series: Materials Science and Engineering 471

Craciun M., (2001), “IDEOLOGY: Shenzhen”, in “Project on the City I: Great Leap Forward”, Taschen

Kojima R., (1995) “Urbanization in China”, The Developing Economies, Vol. 33 N.2, pp. 121-154

Koolhaas R., Boeri S., Kwinter S., Obrist U., Tazi N., (2001) “Mutations”, Actar

Lawrence V. S., (2020) “COVID-19 and China: A Chronology of Events (December 2019 – January 2020)”, Congressional Research Service

Lin N. (2001), “ARCHITECTURE: Shenzhen”, in “Project on the City I: Great Leap Forward”, Taschen

Smith R. E., Quale J.D., (2017) “Offsite Architecture: constructing the future” , Taylor & Francis Group

Liu H. D., Bonino M., Governa F., (2020) “SHENZHEN-ness 3.0: Post Covid-19 Urban Scenarios”, International Joint Design Workshop, Shenzhen University, Politecnico di Torino

Monteverde, C. A., Salza G., (2017) “From roof to ground: rethinking habitat via roofscape design”, Master Thesis, Politecnico di Torino

Ng Kam M. (2011), “Strategic Planning of China’s First Special Economic Zone: Shenzhen City Masterplan (2010-2020)”, Planning Theory and Practice

O’Donnell M., Wong W., Bach J., (2017) “Learning from Shenzhen: China’s Post-Mao Experiment from Special Zone to Model City”, The University of Chicago Press

Sing C. P., Love P. E. D., Fung W. H., He Y. Z., (2015) “Systematic analysis of affordable housing development and pricing structure in Shenzhen, China”, International Journal of Strategic Property Management, Vol. 19 N.1, pp. 58-65

United Nations Human Settlements Program, (2019) “The Story of Shenzhen: Its Economic, Social, and Environmental Transformation”, UN-Habitat

Vera F., Adler V., Uribe M.C., (2020) “What can we do to respond to Covid-19 in informal cities?”, Inter-American Development Bank

Wu R., Canham S., (2009) “Portraits from above: Hong Kong’s informal rooftop communities”, MCCM Creations

SITOGRAPHY

Ambrosino B., (2020) “Why it will be so hard to return to ‘normal’” <https://www.bbc.com/future/article/20200424-why-it-will-be-so-hard-to-return-to-normal>

Bick R., Chang M., Wang K.W., Yu T., (2020) “A blueprint for remote working: Lessons from China” <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/a-blueprint-for-remote-working-lessons-from-china>

Bird T., (2019), “Shenzhen’s history didn’t start in 1979”, <https://www.scmp.com/magazines/post-magazine/long-reads/article/2187228/shenzhens-history-didnt-start-1979-it-goes-back>

Blasco L., (2020) “Coronavirus y teletrabajo: 5 modelos de “oficina del futuro” que están emergiendo gracias a la pandemia” <https://www.bbc.com/mundo/noticias-54356853>

Caixin, (2020) “Depression and Anxiety on the Rise in China, Study Shows” <https://www.sixthtone.com/news/1003598/depression-and-anxiety-on-the-rise-in-china%2C-study-shows#>

Courtney E., (2020) “27 Companies That Have Switched to Long-Term Remote Work” <https://www.flexjobs.com/blog/post/companies-switching-remote-work-long-term/>

Del Bello L., (2020) “How Covid-19 could redesign our world” <https://www.bbc.com/future/article/20200527-coronavirus-how-covid-19-could-redesign-our-world>

Feng J., (2020) “More than 240,000 Chinese companies declare bankruptcy in the first two months of 2020” <https://supchina.com/2020/04/09/more-than-240000-chinese-companies-declare-bankruptcy-in-the-first-two-months-of-2020/>

Fogarty P. et al., (2020) “Coronavirus: How the world of work may change forever”, Unknown Questions Series <https://www.bbc.com/worklife/article/20201023-coronavirus-how-will-the-pandemic-change-the-way-we-work>

Geddes L., (2020) “How staying indoors affects your immune system” <https://www.bbc.com/future/article/20200521-can-staying-inside-weaken-the-immune-system>

Goldkorn J., Tao A., Niewenhuis L., Feng J., (2020) “China’s urban sprawl and the rural underclass left behind” <https://supchina.com/2020/05/12/chinas-urban-sprawl-and-the-rural-underclass-left-behind/>

Hatton J., (2020) “Shenzhen office leasing plunges 70% as new buildings surge” <https://www.mingtiandi.com/real-estate/china-real-estate-research-policy/shenzhen-office-leasing-plunges-70-as-vacancy-soars/>

Kelly J., (2020) “Leading The Work-From-Home Revolution” <https://www.forbes.com/sites/jackkelly/2020/05/24/the-work-from-home-revolution-is-quickly-gaining-momentum/?sh=39056f291848>

Kelly J., (2020) “Facebook CEO Mark Zuckerberg’s Power Move May Be The Biggest Game Changer For The Job Market” <https://www.forbes.com/sites/jackkelly/2020/05/22/facebook-ceo-mark-zuckerbergs-power-move-may-be-the-biggest-game-changer-for-the-job-market/?sh=4c5c3f202643>

SITOGRAPHY

Knibbs K., (2020) “The Pandemic Is Transforming the Rental Economy” <https://www.wired.com/story/covid-19-rental-economy/>

Li S., (2020) “Shenzhen restricts housing purchases after home sales jumped 41% in 2020 1h” <https://www.mingtiandi.com/real-estate/china-real-estate-research-policy/shenzhen-restricts-housing-purchases-after-sales-jump-41/>

Ling Z., (2020) “How China’s nationwide remote working is changing communication” <https://news.cgtn.com/news/2020-03-21/How-China-s-nation-wide-remote-working-is-changing-communication-P2UeVp3LMc/index.html>

Liu Y., (2020) “Is Covid-19 changing our relationships?” <https://www.bbc.com/future/article/20200601-how-is-covid-19-is-affecting-relationships>

Marinova I., (2021) “28 Need-To-Know Remote Work Statistics of 2021” <https://review42.com/resources/remote-work-statistics/>

McLean R., (2020) “These companies plan to make working from home the new normal. As in forever” <https://edition.cnn.com/2020/05/22/tech/work-from-home-companies/index.html>

Moser B., Malzieu T., Petkova P., (2020) “Tactical Urbanism: Reimagining Our Cities post-Covid-19” <https://www.fosterandpartners.com/plus/tactical-urbanism/>

Ortutay B., (2020) “Working from home post-COVID-19? Facebook, Apple, Twitter and Microsoft embracing remote work” <https://eu.usatoday.com/story/tech/2020/05/22/coronavirus-remote-work-post-pandemic/5242420002/>

Ouyang I., (2020) “Office vacancy rates in china’s commercial hubs surge to highest level on record as rents drop amid pandemic headwinds” <https://www.scmp.com/property/article/3081843/office-vacancy-rates-chinas-commercial-hubs-surge-highest-level-record>

Pardes A., (2020) “WFH or Work at the Office—More Tech Employees Can Now Choose” <https://www.wired.com/story/hybrid-workforce-tech-companies-future/>

Ren D., Li S., (2020) “Shenzhen’s unaffordable home prices could hurt Beijing’s plan to turn the Greater Bay Area tech hub into model city”, <https://www.scmp.com/business/china-business/article/3105382/shenzhens-unaffordable-home-prices-could-hurt-beijings-plan>

Songwnich S., (2020) “High office vacancy rates trouble China” <https://www.bangkokpost.com/business/1969515/high-office-vacancy-rates-trouble-china>

Standaert M., (2019) “This Chinese city wants to make housing more affordable, but...not everyone can afford Shenzhen’s new ‘affordable’ homes” <https://www.aljazeera.com/economy/2019/12/13/this-chinese-city-wants-to-make-housing-more-affordable-but#:~:text=Shenzhen's%20average%20price%20per%20square,and%20mobile%20property%20consultancy%20service>

Taylor D. B., (2021) “A Timeline of the Coronavirus Pandemic” <https://www.nytimes.com/article/coronavirus-timeline.html>

Tian D., (2016) “China’s least affordable housing market: Shenzhen”, https://www.chinadaily.com.cn/business/2016-04/15/content_24572883.htm

World Health Organization, (2020) “Listings of WHO’s response to COVID-19” <https://www.who.int/news/item/29-06-2020-covidtimeline>

Zhang P., Rui G., (2020) “China unveils plan to turn Shenzhen into ‘core engine’ of reform” <https://www.scmp.com/news/china/politics/article/3105215/china-unveils-plan-turn-shenzhen-core-engine-reform>

(2019) (“burst! WeWork considers closing China’s office space, Shenzhen’s vacancy rate reaches 65.3%”) https://www.sohu.com/a/349423766_553580

LonggangYantianLuohuFutianNanshanBaoan (2019) (“Shenzhen Grade A office vacancy rate reaches 22.4%, rent continues to fall”) <https://xueqiu.com/2247967694/135697066>



*“ORIGINALITY IS
NOTHING
BUT JUDICIOUS
IMITATION”
VOLTAIRE*



2020-2021