ANALYSIS

- Location
Serrinha is a community located in a central hill of Florianopolis, in the east part of the city center, and it is part of the Trindade neighborhood near the Federal University of Santa Catarina. Serrinha has been gradually occupied by low-income people, giving rise to an area of decay, known as a favela.

- Social aspects
A demographic study shows progressive increase in the population and consequently of the number of houses. In 1993 it was detected the presence of 199 houses, most of wood and with a dimension of 15mq. In 2005 the number of houses in the community had increased to 633 families, with an average of four persons per household. An analysis conducted by the Federal University of Santa Catarina (UFSC) approached various aspects of the community, from transportation, meeting and leisure places, health and urbanization to commercial aspects of public education and employment; focusing primarily on problems and methods of supply and disposal of water and other sources of energy. On these aspects, the study shows that only 28% of the population benefits legally from the water supply given by CASAN, while 68% obtains water from illegal connections. Another major problem in Serrinha is related to the sanitary and igenic services. The houses in Serrinha are generally divided into different sections, and the finest one of these belongs to the original owner. In Serrinha every house is composed of a kitchen, a living room, a bathroom and a bedroom for each occupants, differently from the other the other favelas, where the bathrooms are outdoor. People use to enlarge and finish building when they have some money. Every house is composed of a kitchen, a living room, a bathroom and a bedroom for each occupant. This is a peculiarity of Serrinha, because infact in the other favelas, usually the bathroom are outdoors.

- Economics aspects
According to Data Popular in Brazil currently 12 million people live in favelas, earning R$56.1 billion per year. The study also shows an increase of families who belong to middle class, going from 37% in 2002 to 65% in the end of 2012. Middle class families are those whose income per capita is between R$291,00 and R$1.019.
CUB in Serrinha:
CUB is a monetary indicator that points the cost basis for construction, regulating the real estate market and giving parameters for the construction industry’s costs. According to Sinduscon and Ministério Público the medium CUB of Florianópolis is R$1300/sm.

- Territorial and climatic aspects
Focusing on the distribution of settlements in Serrinha area, a direct correspondence with the evolution of the social phenomenon emerges. First, the village spreads along the "ridge line" parallel to the "contour lines". The buildings, enjoying benefits of lighting and natural ventilation. Indeed, the apparent randomness in the layout of buildings configures as a solution for greater home comfort and structural coherence.

THE PROJECT

- Premises
The project idea is not only the result of analysis and research interpretation, but also the reworking of several surveys in the city of Florianópolis. The direct observations of the places, where is contextualized the projectual design, has allowed us to identify more precisely the aims. The reflection sources were: the spontaneous organic nature of favela urban texture, the formal and the informal city skyline, the land topography, the inhabitants living conditions of the various communities.

- The primary concept
The design concept develops the idea of DNA. Just as a DNA wrapping on itself in order to create “living” organisms, living units creates building organisms. DNA concept is not only a “formal” geometric-aggregative solution, but it also involves the idea of timing, variability, flexibility, partially defined or undefined. Modules of the living cells are mounted in pairs, parallel to themself, developing a system of spiral staircases, that connect to each other structural elements. The result is a creation of a "spiral infrastructural" theoretically infinite. Not more horizontal favela, but a vertical favela.
- **Structure-Infrastructure: Ephemeral and Temporary concept**

The concept of ephemeral architecture that inspired us, coming from P. Cook’s “Plug-in-city”, is linked to reversibility and infrastructure concept. An entirely steel structure allows to assemble and disassemble parts. At the same time a single component of the infrastructure can host individual cells. Although tenants could provide on their own, public funding will be required with rent in order to finance their individual units (see business plan attached). In the project proposed, ephemeral represents the flexibility in thinking about materials, and the possibility to expand both horizontally and vertically.

- **Time, Space and materials: the concept of Flexibility.**

In the modern age, globalization and sustainability influenced space and time in architecture. Globalization shortened times and expanded space of events. Pointing at useful life cycle, recycle, and reuse of materials sustainability highlights the importance of limiting the consumption of material resources. These modern phenomena lead to a new need for living in contemporary spaces: flexibility.

The design proposed experiments three different forms of flexibility:

1. **Spatial flexibility**, understood both in terms of the possibility of horizontal expansion, (expanding the living module of 45 square meters on the landing of competence up to a maximum of 67 square meters), both in terms of vertical expansion, giving the possibility to add the living units one above the other.

2. **the target flexibility**, giving the chance to change the target in a single structural module to transform it into service or space for the community.

3. **Material flexibility**, giving the chance to self-build cladding according to their own tastes and their own economic needs.

- **Economic sustainability: collaboration between public and private**

The self-construction already exists in the favela of Serrinha, but it is not accompanied by the presence of the Municipality. From this consideration, arises the need to build a partnership between the public and private sectors. The audience provides the infrastructure, the private concludes the living units as best prefer.
- **Intensive vs. extensive: the sustainability in land use**

The current urban buildings texture in the favela of Serrinha is extensive and continues to grow up, in a totally unsustainable way. Land use in the informal city is indiscriminate, due to an inability on the part of the Municipality to regulate a community. The proposed design greatly restricts the use of land, developing a solution intensive vertical, thus preserving the free areas still not completely saturated. This solution completely redesigns the existing favela skyline, thus giving visibility to places and communities that currently are being increasingly marginalized.

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**BUSINESS PLAN**

### SOIL PREPARATION AND COSTS OF WORKSITE including:

- Transportation of land within the work
- Digging in the land of outdoor clay semi-hard, with manual means, removal of excavated material and truck loading
- Shotcrete thickness of 20 cm, for the stabilization of slopes.
- Well cyclopean concrete foundation
- Removing the vegetation of shrubs and herbs inside and outside the building, with the shredder.
- Transport waste material resulting from excavations
  Rent for 3 months of a 40-meter crane with a capacity of maximum 750 kg.

**R $ 7,400**

### STRUCTURE including:

- Staircase elements in welded steel and placed in prefab work, comprense finishes and steel handrails, including transportation and installation
- A36 steel beams and columns format HEM (20 * 20 )
- Attic floor in steel pots and concrete.

**R $ 50,600**

### PLANS including:

Riser installation inspection
descendants, gutters, storks support, and support collars
pvc pipes for water systems
Cockpit plastic pvc insulated single core cables

**R $ 3,100**

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*All amounts are inclusive, in addition to construction costs, also to maintenance costs even decades, running costs, cost of securing the site, and the cost of labor.*

*Prices are in brazilian Reais and they are refer to the average price of the largest manufacturers and dealers in the brasilian area (source: http://www.brasil.geradordeprecos.info )*

*Costs make reference to a single housing units in a solution of eight aggregative units (or four floors).*
Time-line of the interventions

<table>
<thead>
<tr>
<th>TIME</th>
<th>OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 months</td>
<td>temporary financing from Municipality of Florianopolis for the construction of the infrastructure</td>
</tr>
<tr>
<td>1 months</td>
<td>land preparation and construction</td>
</tr>
<tr>
<td>6 months</td>
<td>infrastructure project completed</td>
</tr>
<tr>
<td>9 months</td>
<td>conclusion of the cladding and the finishes by DIY</td>
</tr>
<tr>
<td>1 years</td>
<td>rent of living units according to the above mentioned monthly installments</td>
</tr>
<tr>
<td>7 years</td>
<td>return on the capital invested by the Municipality</td>
</tr>
</tbody>
</table>

- **Resume project costs**

  - total cost of ' resort living units  
    R$ 61,100
  - average cost of infil and finishes external and internal  
    R$ 10,100 ( per units )
  - total cost of single living units  
    R$ 90,200
  - total cost housing cell in euro  
    € 30,000
  - cost per sqm  
    € 667

- **Feasibility of economic capacity on the basis of population financial**

  - infrastructure cost  
    R $ 61,100
  - average income in Serrinha  
    R $ 3,600
  - 1/5 of average salary  
    R $ 720
  - Nº monthly installments  
    85 month (7 years )
  - Mensyl installment  
    R $ 719

- **Risk analysis**

  The surgery has minimal risk factors such as the security of the return of capital by the rent of individual living units. To avoid this risk needs to take the necessary precautions, for example, through bank guarantees.

- **Cost-benefit analysis**

  The cost is negligible when compared with the work with existing investments by the Municipality of Florianopolis. Just this premise to guess that the cost-benefit analysis is overwhelmingly positive. Finally, by calculating the capital invested falling within 7 years.