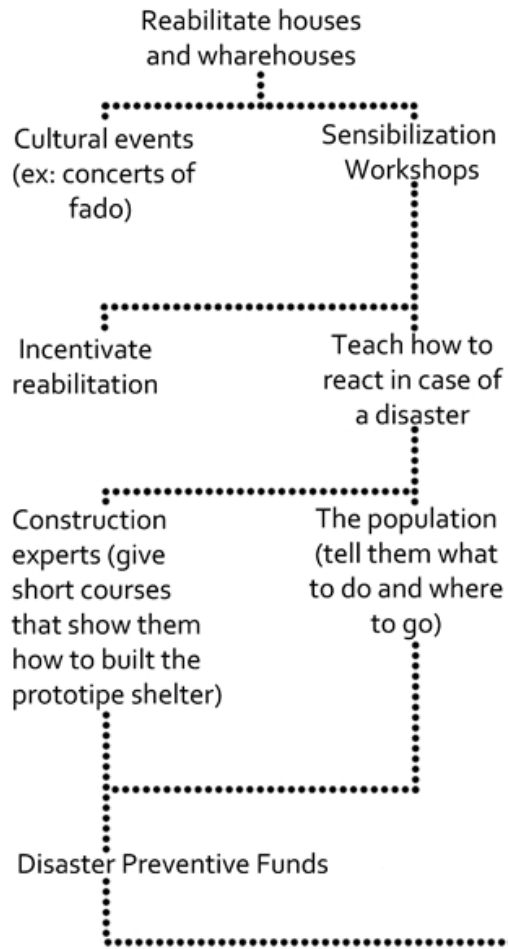
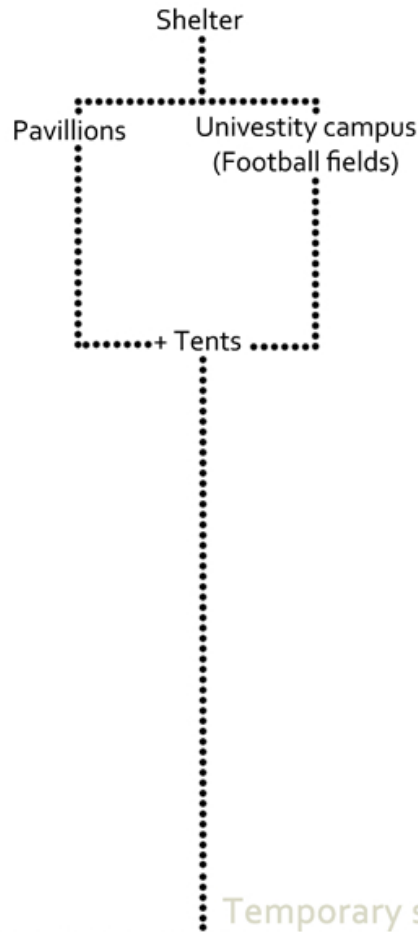


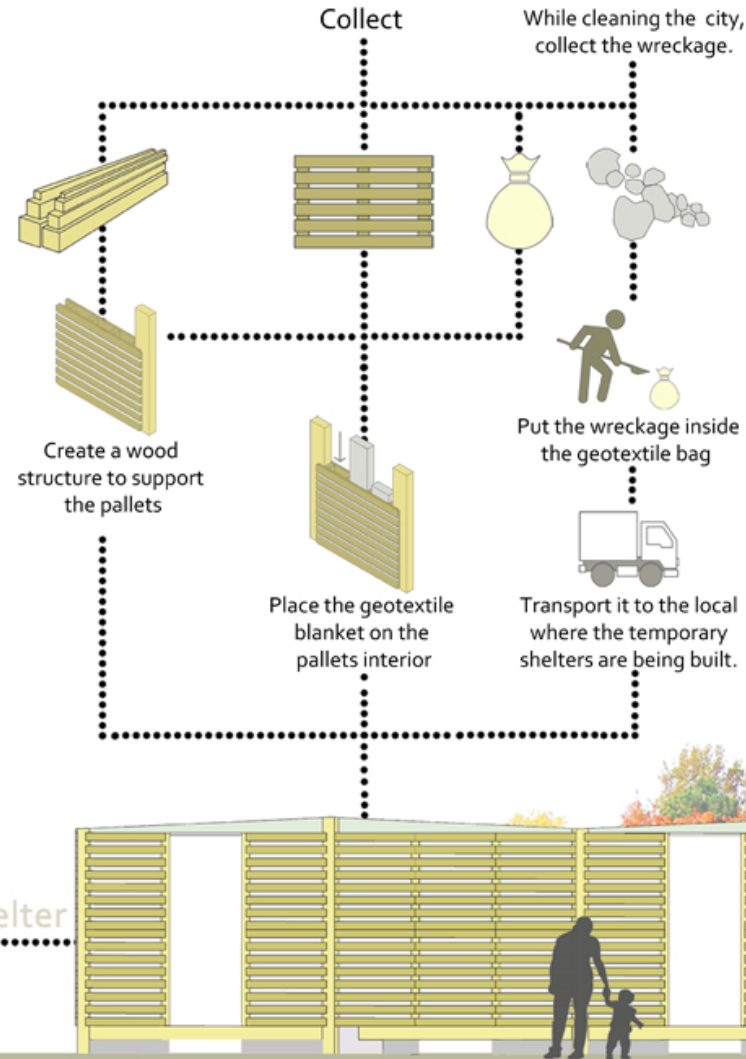
PREVENTIVE MEASURES (PRE-DISASTER)



IMMEDIATE MEASURES (DISASTER)



MEDIUM/LONG TERM MEASURES (POS-DISASTER)



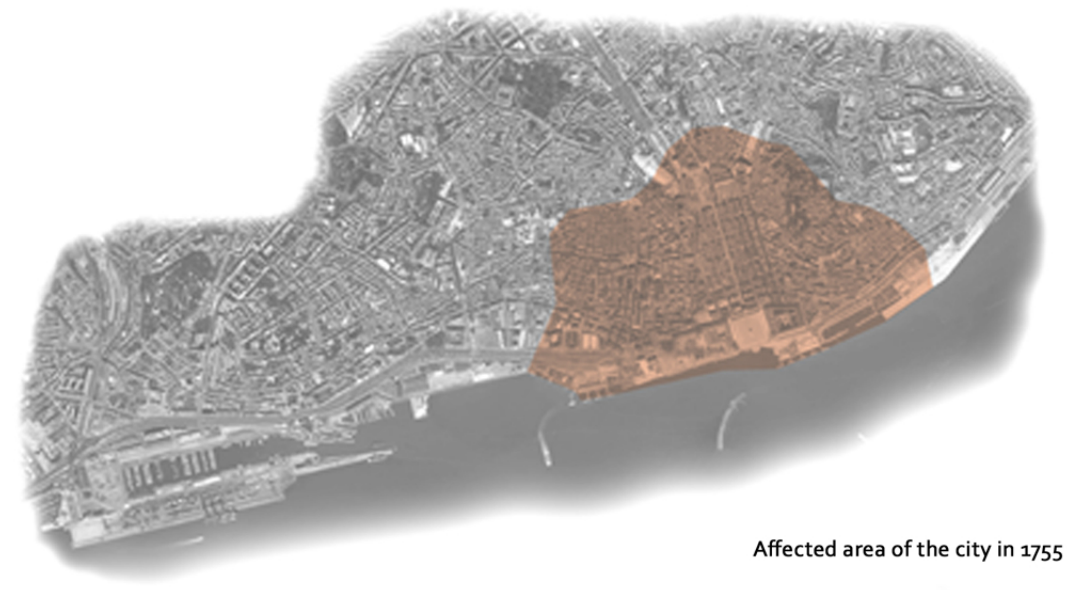
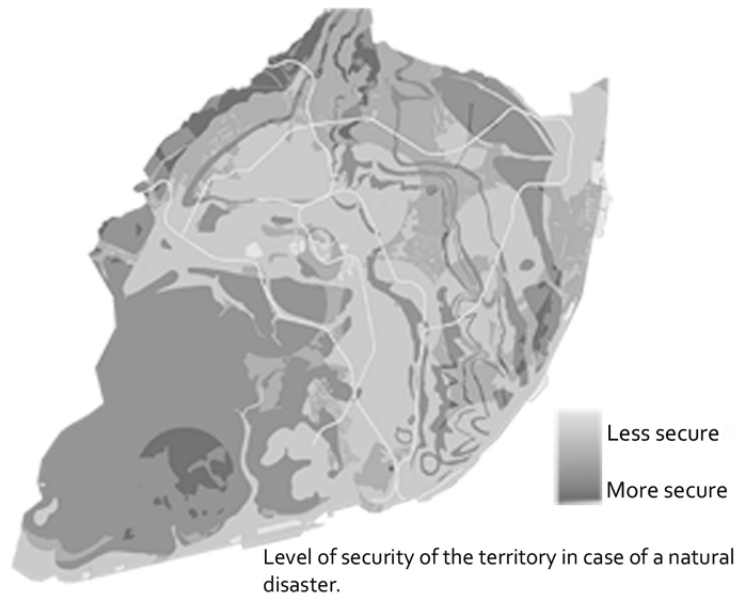
Ana Joao Viana _ana.joao.viana@gmail.com
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6th i/rec student competition
 Portugal 07/05/2013



LISBON

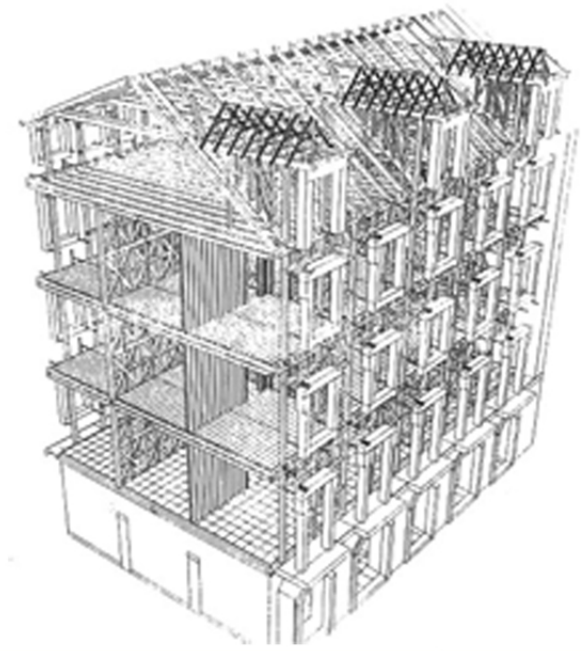


Affected area of the city in 1755

In 1755 Lisbon was devastated by an earthquake and a tsunami followed by a fire that lasted 6 days, and is predicted that a similar disaster may happen again.

This city is the capital of Portugal and the current home for about 547.631 people. Therefore, if something were to happen to this city, the whole country would suffer a major shock, falling probably in a greater crisis. For this reason it is extremely important to create a preventive plan that aims to minimize the damage if this scenario is confirmed.

After the disaster of 1755, there was the need, as in any similar situation, to rebuild the city as soon as possible. For this purpose it was created a structural system, designated "**estrutura pombalina**" (preceding, in a way, the pre fabrication method) that was based in a structural wood cage filled with **wreckage** from the city. This "**wood cage**" was a structural innovation that reflected a very advanced vision for that time in terms of constructive methods.



LESSONS & HISTORY





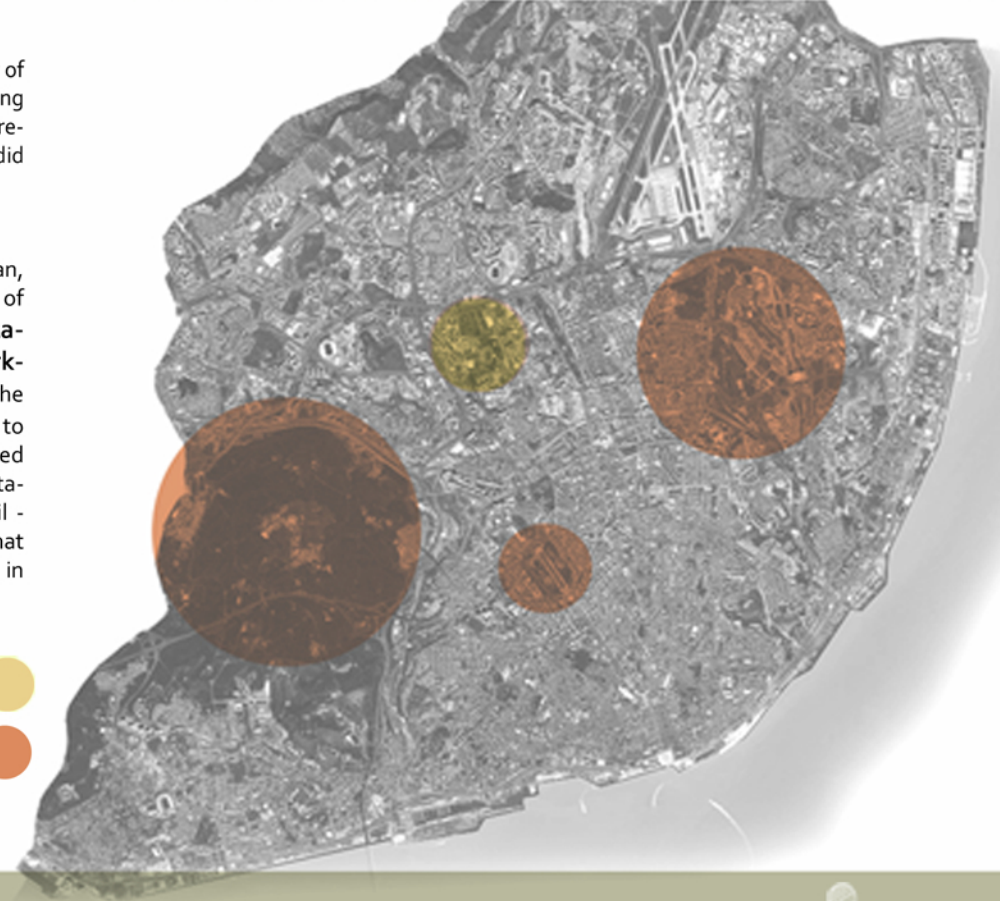
Nowadays, it's necessary the rehabilitation of the buildings situated on the center of Lisbon because, as the time passes, the population made significant changes, compromising the structural behavior of these constructions. There are also abandoned houses and warehouses, without any kind of supervision that, in case of a disaster, would fall as easily as they did in the past.

Therefore, as pre catastrophe measures, it is proposed a **rehabilitation** plan, prioritizing the calculated affected zone which would be done through the awareness of the people for the possible destruction of the buildings. It is also proposed the **reutilization** of the **abandoned constructions** for **cultural events** and for preventive **workshops**, in which it is intended to prepare the population in case of a natural disaster. The money raised would revert for a "**catastrophe fund**" and utilized, if any disaster were to happen, in the construction of the shelters, houses, public spaces. It would be estimated the quantity necessary to this measures and the rest would serve to continue the rehabilitation of the city. It is known the existence of a plan design by the Lisbon city council - http://cultura.cm-lisboa.pt/fileadmin/templates/cultura_novo/flash/estrategias.pdf - that intends not only to rehabilitate the city but also to revive the culture of the country, in which we thought our pre catastrophe measures could be inserted.

Places for emergency shelters



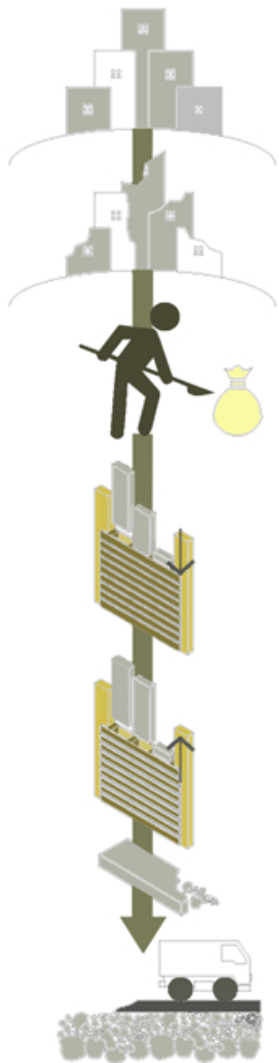
Places for temporary shelters



CULTURE & PREVENTION

A study based on the previous catastrophe was conducted in order to predict the affectation area of the city and to organize the possible locations (outside the affected area) that could accommodate the victims (mostly green unoccupied areas like campsites, city parks and football fields). It was decided not to occupy public squares because that would make the recovery more difficult both for the city and the population.

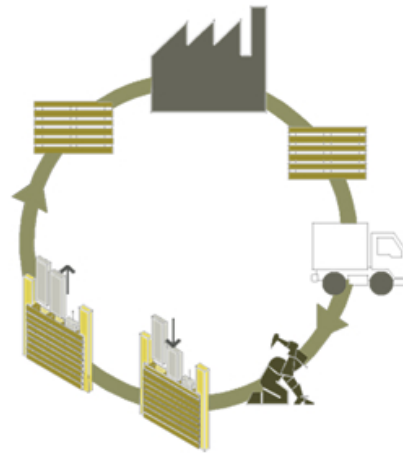




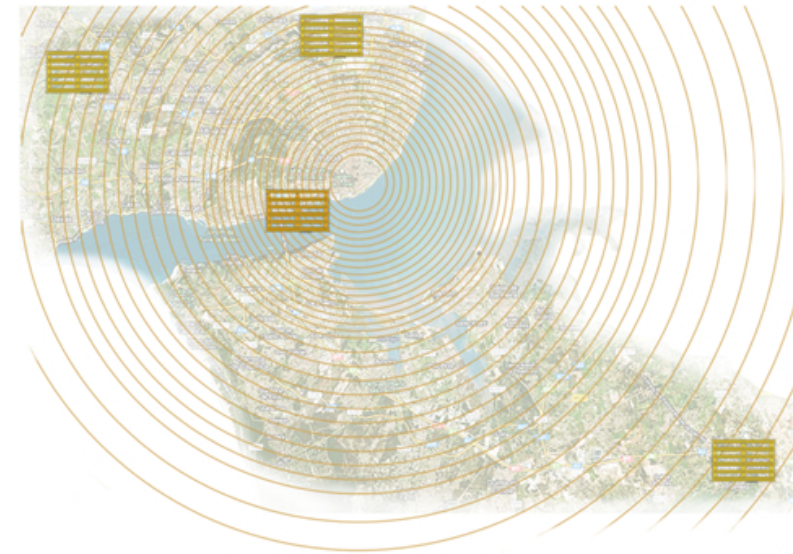
It is of the utmost importance the fast cleaning of the city, so it can resume to its daily life and trading activities.


The gathering and reutilization of the **wreckage** is a fast way to help the city "regain" its strength and to build the shelters.

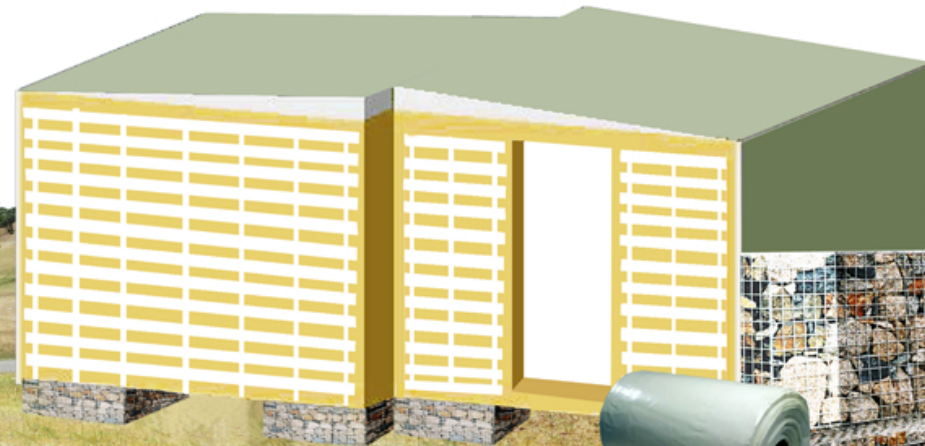
When the shelters are no longer needed by the population, these remains can be **reused** in the construction of highways, roads and infrastructures that can contribute to the recovery of the city.



The **pallet** is the main material of construction and when it ceases to perform its function returns to its life cycle.



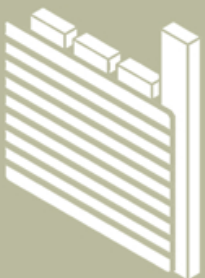
 Surrounding areas that can provide the necessary amounts of the pallets (saving not only money but also time).



The shelters were elevated from the ground and supported by **gabions** (filled with wreckage from the city).



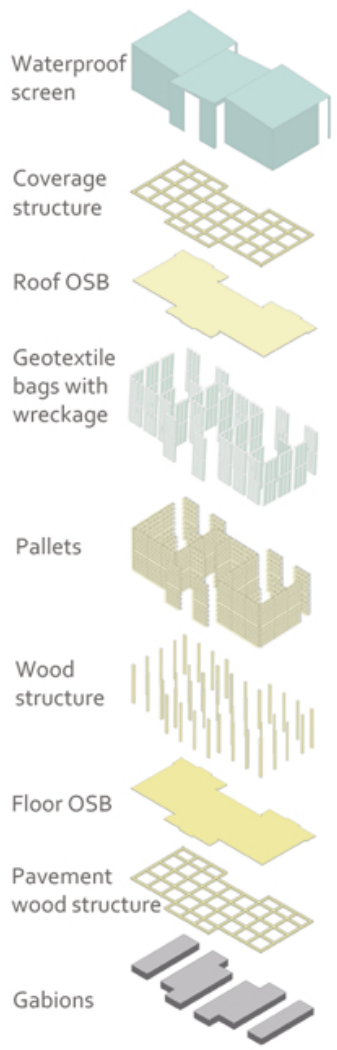
CONTEXT & MATERIALS



In order to produce less waste, it was settled as a principal the reuse of the materials after they serve their purpose in the construction of the shelters. The main materials chosen were:
 pallets (as infrastructure), geotextile bags (that would coat the interiors of the pallets) and small wreckage (that would be used as isolation and placed inside the bags).

This project is also a reinterpretation of the local history, since in the catastrophe of 1755 the houses were reconstructed using a similar process as this one: they used wood as structure and filled the interior of the walls with wreckage and clay.



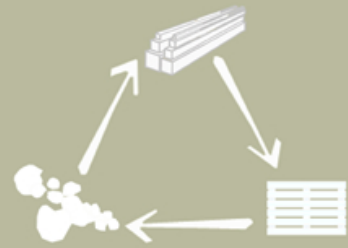


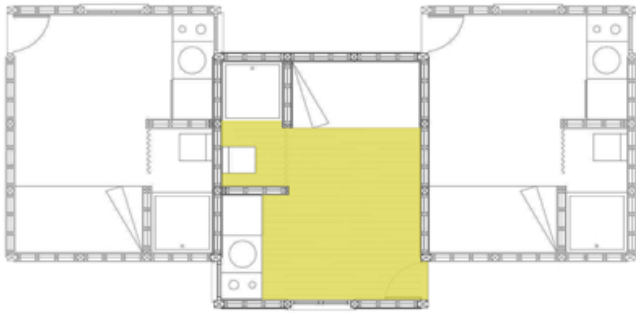
When the disaster occurs, the population would be immediately sheltered in pavilions. While they're there, **the construction** of the temporary houses begins: the wood structure that would support the shelters would be built inside the pavilions and it would be also, during that time, that the collect and assemble of the wreckage from the city would be made.

Afterwards, both the structure and the wreckage would be transported to the locations where the habitations would be built and the construction of the temporary houses would start: first, the gabions would be filled with wreckage, and serve as a support for the wood structure; then the pallets would be placed on the structure, the geotextile bags would go inside them and would be filled with wreckage; then both the pavement and the coverture would be made with OSB material; and, at last, to waterproof the shelters, there would be placed a screen that would coat the habitation.

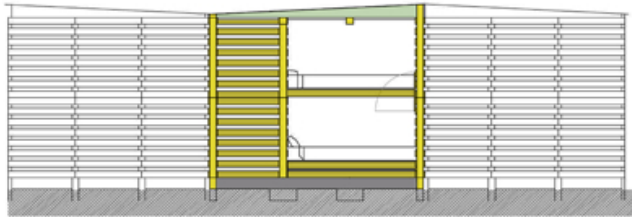


POTENTIALIALITY & CONSTRUCTION

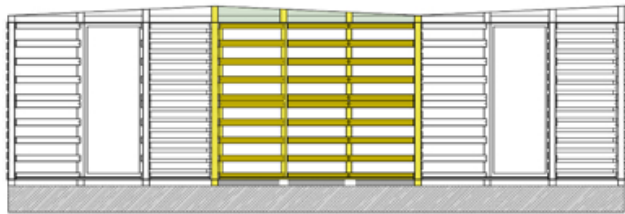




plant



section



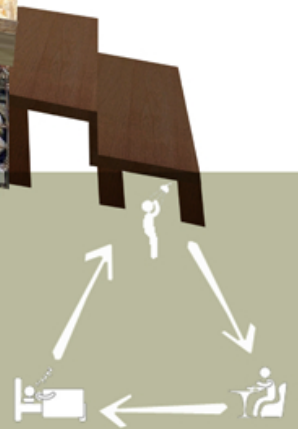
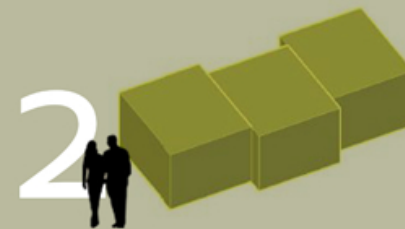
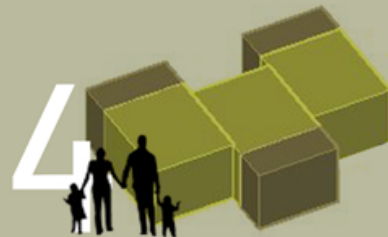
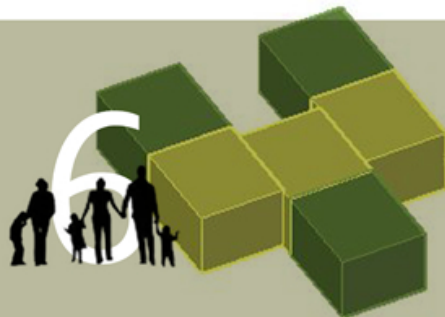
elevation

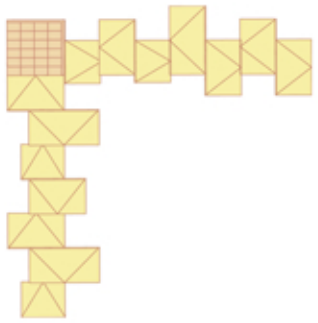
In order to construct this shelter, we tried to comprehend the life style of the population of this location. Because we are dealing with a city, which is a capital, where the inhabitants are independent and aren't used to live in a large space, the project of the temporary habitations is done in a minimal amount of space and pays attention only to the primary needs (sleeping, eating and cleaning).

The main concerns that we had on this project were the easy construction and maintenance, as well as the flexible aspect of the habitation, which can adapt very easily to different kinds of families (each shelter can accommodate from one to four people). This can be done in two ways: either with the reconfiguration of the "sleep" space and the utilization of bunks, or if you add the extra module.



PROTECTION & HABITATION

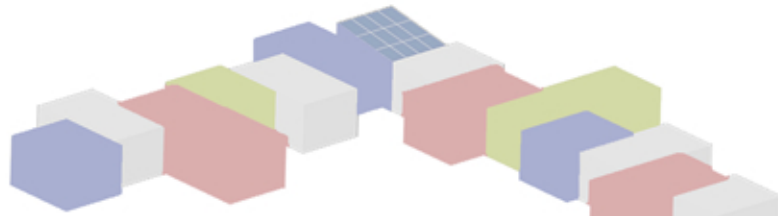




Location of the center of solar energy production.



Central of storage and distribution of water, gas, electricity and sewage.



The layout of the neighborhood was thought so there were **gaps**, which can stimulate **social reintegration** and encourage **group activities**. The screens of some houses would be colored and the **different colors** would serve as a space reference (improving mobility and helping organization) and as a **mark of individuality** (each house would be unique, thought of as a home and personalized by each family).

Since Portugal is a country with a mild weather and most of the days of the year are sunny, it was decided to take advantage of the **solar energy** (which would be achieved by the placement of panels). In order to avoid the waste of energy and infrastructures, it was planned the colocation of one panel (in a centralized position) for every 14 houses (7+7), forming a standard module. This habitations module has the advantage of being able to adapt to topography and obstacles (like trees or roads), which results in a better **space economy**.

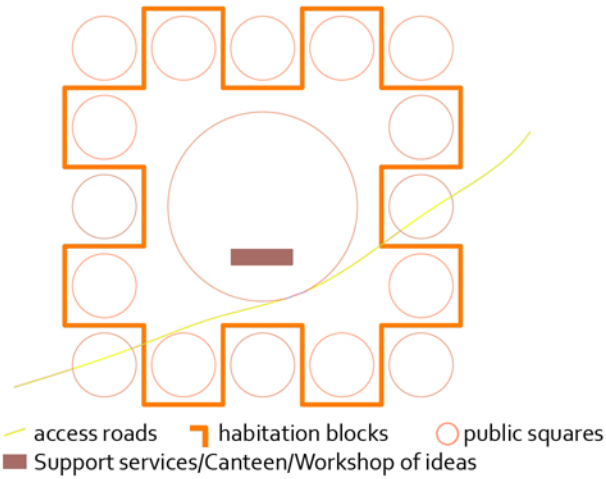


NEIGHBORHOOD & COMUNITY



Regarding the aggregation of the habitations, it was taken into account the adaptation to the **lifestyle** of the victims and to the **culture** of the city. It was decided to produce a system that reduced the number of pallets necessary for each shelter and, therefore, reduced the **efforts of the construction**. As a result, in the urban plan appear small interstitial spaces, that mark the entry of the houses and that are accentuated when the extra modules are added.





In order to satisfy some **necessities** of the inhabitants, help them to find a new quotidian and simultaneously encourage them to live as a **community**, it is proposed the installation of some equipment placed throughout the neighborhood, on strategic locations.

The criterion of the selection of these equipments was based on a presupposition of community spirit and mutual **aid** between victims, using, thus, the architecture as a sociological instrument. It is given the outmost importance to the creation of places where people can **socialize**, share experiences and traumas and support one another, therefore, it is suggested for each block an infirmary, a market, a laundry, a coffee and a canteen, plus one recreational space common to all the neighborhood. It was also decided to create a space that can either function as **"workshop of ideas"** and has the purpose to incentive creativity, or that can serve as local **commerce**, in which the victims can start their own business.



Example of possible application of the model. The L form makes it more easy to adapt to various types of land.

PLANING & FUTURE

