



**SUSTAINABLE POST
DISASTER RECONSTRUCTION
FROM RECOVERY TO RISK REDUCTION**



[ANGRA NEEDS...]

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WHERE?

Angra do Heroísmo is a city in Terceira Island, Azores, Portugal.

The city has a considerable disaster risk due to its seismic and volcanic activity.

WHY HERE?

In 1980, an earthquake with a magnitude of 6.9 in the Richter scale caused 60 deaths and the destruction of 1800 among the 6711 of the city's buildings. The reconstruction works preserved the architectural characteristics and values,

leading UNESCO to consider the city as world heritage of humanity.

ANGRA'S
 **POPULATION 37000**
150 INHAB/KM2



LOCATION



**[ANGRA
NEEDS_]02**



WHAT?

- + CONSCIOUSNESS**
Values and habits 
- + ECONOMY**
Using local resources 
- + MATERIALS**
Home production 
- + VEGETABLE GARDENS**
Community 
- + INDUSTRIAL**
REACTIVATION 

The activities of Angra's population are considerably associated to **agriculture, cattle rising and tourism**. It is typical the presence of vegetable-gardens in the houses' yards, and people use to garden it in order to raise the household economy and overcome some difficulties in finding some products, due to the insular location.

The city is rich in local traditions, such as pottery and woodwork, and the Terceira Island has good ceramic and wood resources. The island has also

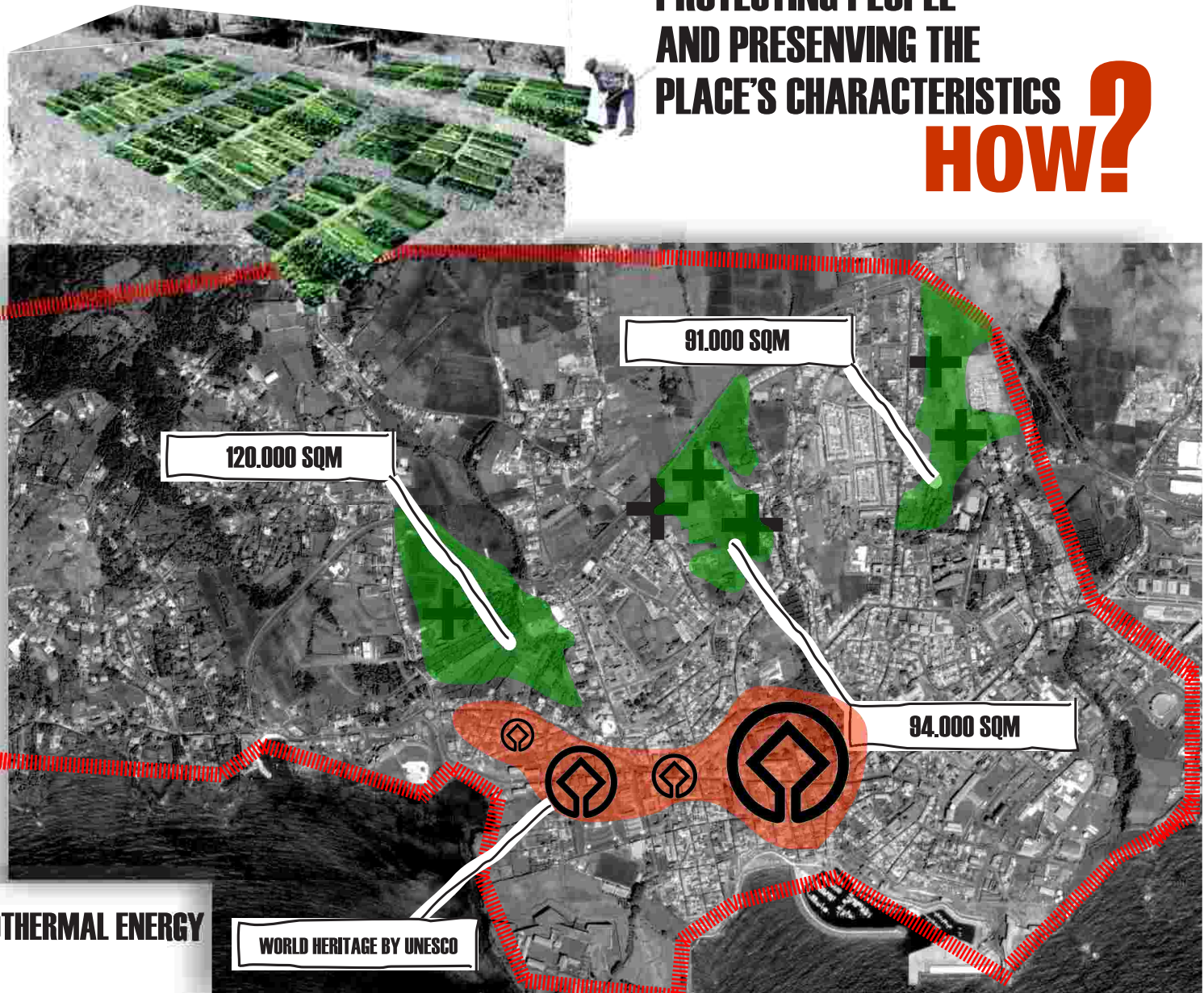
great conditions to **explore geothermal energy**.

+ GEOTHERMAL ENERGY



PROTECTING PEOPLE AND PRESEVING THE PLACE'S CHARACTERISTICS HOW?

CONTEXT





PRE-PLANING

EMERGENCY SHELTER

TEMPORARY SHELTER

TEMPORARY HOUSING

AFTER RECONSTRUCTION



DAY 1/2

WEEK 1/2

YEAR 1/2



BUILDING BACK BETTER

WHAT?

In order to encourage the tourism, it is suggested the construction of a permanent building, some small structures, and prepare the ground with infrastructures. These facilities support

the **touristic activities** and offer gardening zones for locals and tourists, and also provide spaces for cultural events, such as workshops, concerts, theaters, etc. After a disaster, these equipments and spaces can be used to assure the first response, providing emergency and temporary shelter, spaces for personal hygiene and nourishment.

At the same time, it is suggested the rehabilitation and reactivation of a local company that produces traditional roof tiles and blocks. Thus, this company could produce materials to help on the maintenance of existing buildings, and provide resources in case of a post-disaster reconstruction program. Therefore, it would help to improve the local economy and also be a great space for touristic visiting.

The strategy focuses on tourism, agriculture and cattle rising activities, reactivation of local industry, re-usage of the materials, and population's consciousness.



STRATEGY

- Local house
- Tourism facilities
- Small constructions
- Place infrastructures
- Emergency shelter
- Temporary shelter
- Temporary Housing
- TH + infrastructures



PRE-PLANING

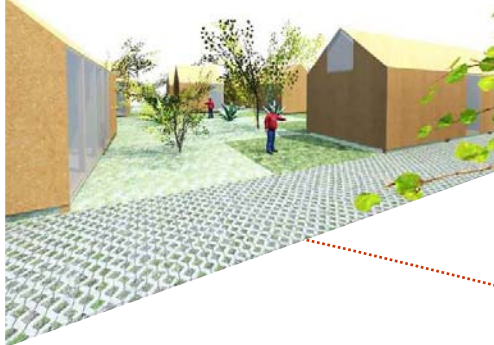
In the meanwhile, temporary houses can be erected in the sites already prepared with infrastructures and near

the **vegetable-gardens**. Thus, the strategy suggests the creation of spaces that offer public spaces and facilities to improve the city's quality of life during 'piece time', but which have all the conditions to be used during emergency situations.

Thus, the victims can grow fresh produce as in their houses before the disaster. These temporary settlements are provided with streets, public spaces such as small squares, and some public services like supermarkets, groceries,

etc. **Therefore, even in a temporary location, people can gradually return to their daily life.**

After the reconstruction period, the temporary units are removed and the area returns to its previous usage, agriculture and tourism activities.



#1

#4

#2

#3

PUBLIC SQUARE

**TEMPORARY
SETTLEMENT WITH ALL
THE CONDITIONS FOR A
NORMAL LIFE!!!**

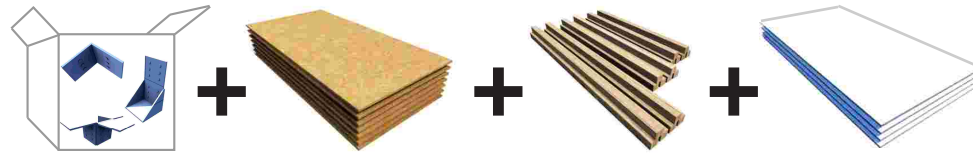


ACTION



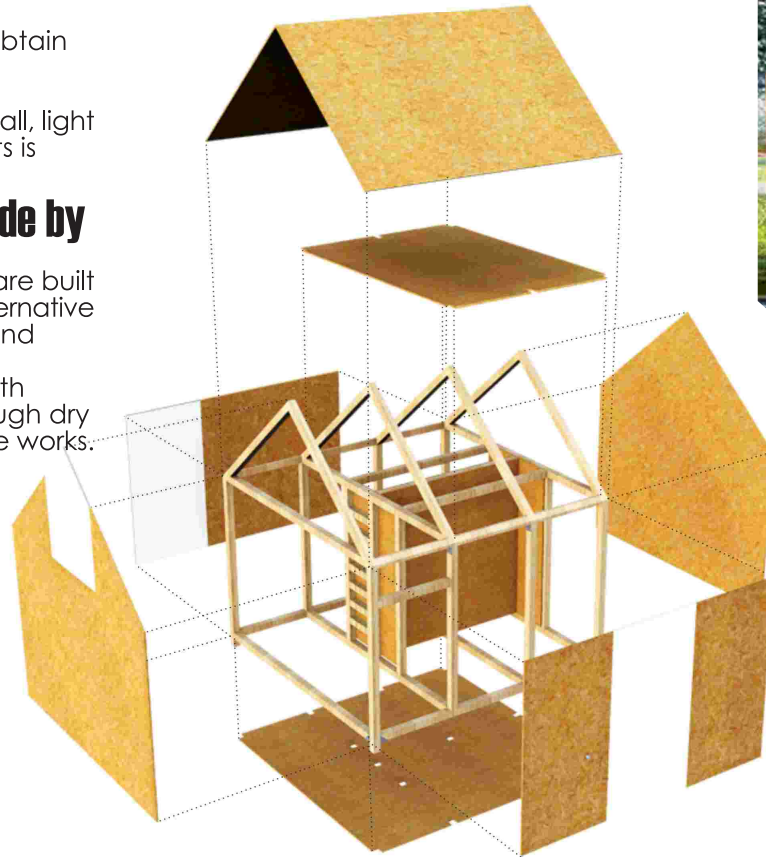
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HOW IT'S DONE?



= WHAT WE NEED

The units are built with **national materials** that are easy to obtain and transport, economic, and recyclable or reusable. A timber structure based on small, light and easy to assemble elements is covered with OSB panels, a **sustainable material made by wood waste**. The windows are built with polycarbonate, a great alternative to glass due to its lightweight and impact resistance. All elements are connected with standardized steel pieces through dry joints to simplify the disassemble works.



CONSTRUCTION



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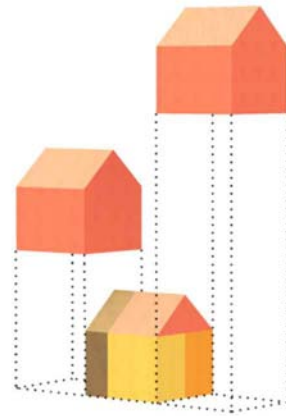
THE SOLUTION...

The temporary unit is based in two modules.

The **First** module provides the minimum conditions to guarantee space for personal hygiene, cooking and resting.

The **Second** module is multifunctional and can be used for several activities (bedroom, living room, etc.). The flexibility of this solution allows the progressive growing of the accommodation according to the families' possibilities, needs and expectations.

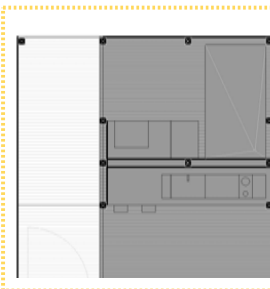
After their intended period of use, the temporary units can be placed next to the rebuilt houses and reused as extensions or spaces to support the gardening activities.



PROGRESSIVE GROWING !!!



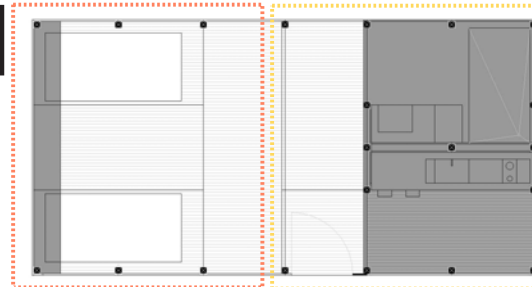
3.75m



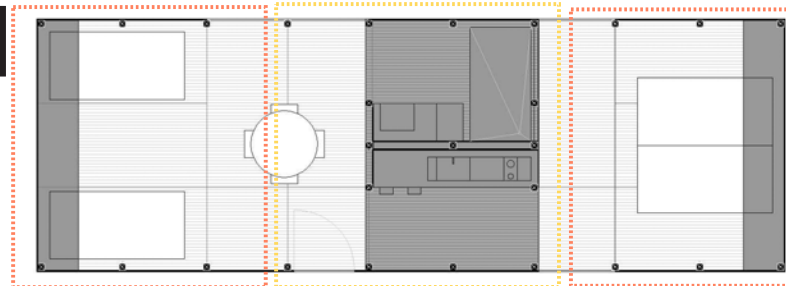
ii MINIMUM



ii + ii



ii + ii + ii





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