

POLITECNICO DI TORINO  
SECOND SCHOOL OF ARCHITECTURE  
Master of Science in Architecture for Sustainability  
**Honors theses**

---

**ECOBX\_minimal housing unit for sustainable emergency settlement**

by Andrea Torrisi

Tutor: Riccardo Pollo

Co-tutor: Giuseppe Roccasalva

The period in which we live requires a human being to adapt to a series of changes that the world poses. Among these there are of special urgency, to be implemented as a result of catastrophic events.

We recall the devastating 2004 tsunami that struck South East Asia or Hurricane Katrina in 2005, the passage of which the United States of America, New Orleans and devastated entire towns. In our country the L'Aquila earthquake in 2009 or more recently that of Reggio Emilia in 2012 have destroyed whole villages and in particular have raised the serious problem of finding a new place for the thousands of families left homeless.

The Italian government through emergency legislation while promising new homes as quickly as possible, it is not able to give new homes the most suitable and comfortable leaving them to live in tents which I think are absolutely unsuitable for prolonged periods.

With my work I have chosen to explore the development of a new housing unit to replace the tents installed following a catastrophic event.

I wondered if it is possible to design a 'flat (ground) the characteristics of which are self-construction on the spot, transformability, dry construction, flexibility, modularity, light weight, sustainability, respect for the environment and especially the prefabricatebility in series which lowers the cost and production time. All these parameters are related to speed and ready to use in order to replace in the shortest time possible the use of accommodation such as curtains.

In addition, this prototype used as the emergency may have for its other destinations such as seasonal accommodation (bungalows by the sea or mountain) with the appropriate changes, or could become accommodation for singles or small families, as well as exhibition design to place anywhere you need it.

## Preface

### Chapter 1: The history of prefabrication

- 1.1: Introduction
- 1.2: The Archetypes
- 1.3: Age pioneer and the first prototypes
- 1.4: The Twentieth Century
- 1.5: Europe in the Twentieth Century
- 1.6: The archetype of contemporary
- 1.7: Conclusions

### Chapter 2: From modern to contemporary filing of examples

- 2.1: Requirements modern
- 2.2: Projects modern
- 2.3: The latest developments
- 2.4: Projects contemporary
- 2.5: Conclusions

### Chapter 3: The catastrophic events

- 3.1: Introduction
- 3.2: Natural Disasters
- 3.3: anthropogenic disasters

### Chapter 4: Emergency

- 4.1: How do you respond to the emergency
- 4.2: Guidelines for the realization of a reception camp
- 4.3: Cases international and national cases
- 4.4: Industrialization for emergency
- 4.5: Designing the Emergency Service Units
- 4.6: Design the emergency systems and technologies of the 'Service Units
- 4.7: Conclusions: the cost of a refugee camp

### Chapter 5: Case Study: Piedmont

- 5.1: The Piedmont territorial framework
- 5.2: The regional planning instruments
- 5.3: The soil monitoring in Piedmont
- 5.4: Criteria and landscape protection Piedmont
- 5.5: Sustainable Design in Piedmont
- 5.6: The design process in case of emergency
- 5.7: Conclusions

### Chapter 6: Analysis of environmental risk in Piedmont

- 6.1: Situation Piemontese

### Chapter 7: Sustainability

- 7.1: Current Situation
- 7.2: Innovations sustainable design

## Chapter 8: The unit beyond the emergency

8.1: Introduction

8.2: The tourism sector

8.3: The residential sector

8.4: The commercial sector

8.5: The shipbuilding industry

8.6: The requirements go beyond the emergency

8.7: The identification of an area beyond the emergency

8.8: Conclusions

## Chapter 9: The project

9.1: Introduction

9.2: The project area

9.3: The goals

9.4: Some premises to the project

9.5: The project: the basic module

9.6: The design innovation

Attachments: Urban

Regional framework

Provincial framework

Inter Civil Protection Plan

Municipal Employee

Municipal Employee

Employee municipal areas at risk

Employee Civil Protection

Employee areas of shelter

Employee photo

Arranging emergency

Reusing units, post-emergency

Attachments: Design and Innovation  
Preparation of emergency  
Sizing of the emergency  
Plan of emergency module  
Brochures and mode of transport  
Modular decomposition  
Sizing of tables with the front steps  
Sizing of tables with entrance ramp  
Prefabricated modular composition  
Plant and engaged elements  
Stratigraphy of the partitions  
Types of dry mounting  
Ecoself\_unit service, plan and sections  
Ecoself\_unit service schedules  
Ecoself\_unit service schedules  
Ecoself\_unit service schedules  
Planimetry emergency area  
Description of the emergency  
Redevelopment beyond the emergency  
Description of redevelopment beyond the emergency  
Ecobox\_external design, steps  
Ecobox\_allestimento external ramp  
Ecobox\_Ecoself\_prospect South  
Ecobox\_Ecoself\_prospect North  
Ecobox\_Ecoself\_prospect West  
Ecobox\_Ecoself\_prospect East  
Units compared  
Expandability and flexibility in emergency  
Expandability and flexibility in emergency and over  
Photo insert  
Photo insert  
Conclusion  
References: Bibliography  
Thesis  
Texts  
Magazines & Periodicals  
Sitography

For further information, e-mail:  
Andrea Torrisi: [andrea\\_torrisi\\_88@hotmail.it](mailto:andrea_torrisi_88@hotmail.it)