POLITECNICO
DI TORINO

Honours thesis

COURSE OF MASTER OF SCIENCE IN SUSTAINABLE ARCHITECTURE

The temporary housing emergency: a possible solution

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1 – The built living unit

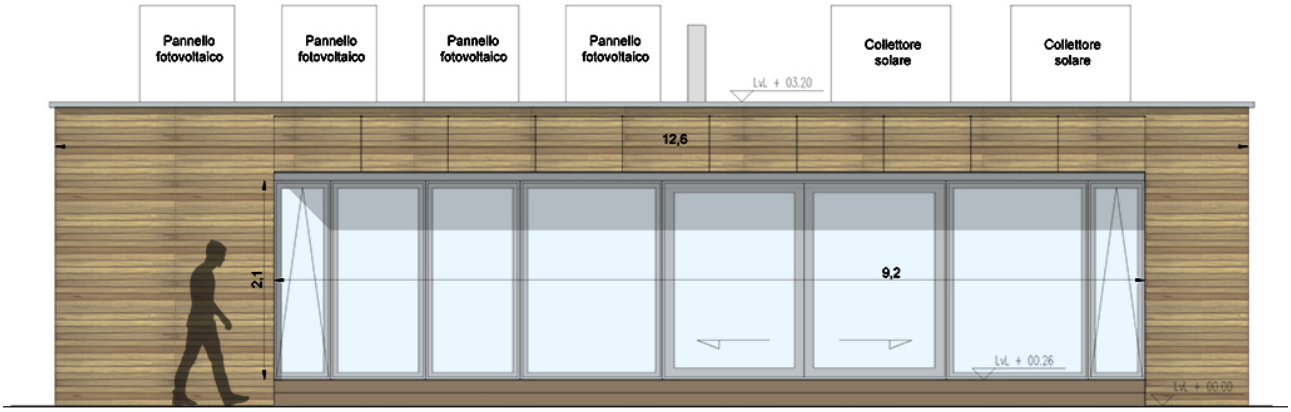
This work began following the experience carried out in Dublin, during the last semester of the Master's degree. The experience involved working for the Ceardean Design & Construction Studio, within the Erasmus Placement project. During this period, I had the opportunity to design Ireland's first fully compliant shipping container Home. The idea for this project was deeply rooted in the need of the Irish population, which is increasingly being affected by the economic crisis. The number of families in need grows every year and, more often than not, people are forced to live in the streets. For this reason, the Studio decided to realize a prototype of a living unit that can be useful to face the social emergency.

Stemming from the project carried out during the months in Dublin, the aim of the thesis is to design a living unit in compliance with the Italian legislation and also to determine in which situations this prototype could be used.

The thesis work is divided into several parts:

- In the first part, the thesis analyses the "object" container, highlighting its technical characteristics and the different types currently available on the market;
- Then, the thesis presents various examples of temporary housing and emergency housing units, from the first decades of the 1900s to this date;
- The third chapter analyses different projects using containers. This chapter is divided by building types: residential, commercial / exhibition, student homes, and emergency housing units;
- Finally, the last chapter deals with the detailed description of the final project. This last part explores the technical and compositional characteristics of the project, and so does by

using two different programs: Termolog for the energy analysis and RETScreen for testing the solar thermal and the photovoltaic.
One of the difficulties of the project was to respect all the constraints of the law and solve the problems that an architectural object of limited size may present. In addition, the will was to eliminate the stereotype that temporary accommodation is uncomfortable and unwelcoming, thus designing a welcoming accommodation – just as in a traditional house.



2 – South Elevation

As shown in the thesis, the housing module can meet Italian Laws regarding the regulation of hygiene, natural light and the transmittance of all components. Furthermore, the housing module is designed to work independently from the mains and, for this reason, it allows to be positioned even in isolated places. Indeed, the house has been equipped with:
- 4 photovoltaic panels;
- 2 solar collectors;
- 1 rainwater tank.

Obviously, in order to function continuously, the module must be supported externally to recharge water or energy, for instance, in case the weather conditions are extremely unfavourable for a long period of time. However, it turns out to be a viable and dignified solution for specific interventions to families in difficulty, for example, in the first days following a possible natural disaster.
The Living Unit was built from 25th to 30th November 2014, showcased into the Irish Museum of Modern Art (IMMA) in Dublin, and was later donated to the charity organization Saint Vincent de Paul. The organization plans to place the house in their Deer park Hostel garden, which currently provides emergency shelter for homeless men in Cork. This project was carried out for charity and all the materials were donated by multiple companies. This constituted another difficulty of the project, as the original design underwent multiple modifications, in order to meet the generosity of those companies.

3 – During the unit construction

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