

Requirements

Definition & Specifications

In humanitarian field, the different climatic contexts require from NGOs a huge faculty of adaptation as each situation calls for a precise answer: recent emergencies draw attention to limits of current standard tent to be adapted in all climates or in places with high daily-temperature ranges. As result, the lack of insulation materials on the field is more critical than the request of structural elements (timber or steel) and blocks, which are easily recoverable from local markets.

For this reason, potential novel shelters should mainly provide flexible living accommodation that adequately winterizes the beneficiaries; they might be compatible with standard tent structures and locally available structures (frames, simple poles, trees etc.); finally, they could be adaptable to diverse functions depending on needs (e.g. for insulating unfinished and damaged buildings).

Requirements (columns), metrics (rows) and values (bold cells)

Lightness	Portability	Simplicity	Cheapness	Adaptability	Reliability	Durability	Sustainability	Safety
5 Kg/m²		Weight / Footprint Area 17,5 m² (5 persons)						
0,8 m³		Packaging Volume						
1 h by 2 p.		Assembly Time						
800 €		Production Cost						
Medium		Industrial finishing						
Thermal Conductivity		0,050 W/mK						
Water Absorption		0,01%						
Life Span		2 years						
Disposal Use		Recyclable						
Ventilation Openings		5000 cm²						
Fire Resistance (EN13501-1)		E, B						

First mock-up tested together with the Type 1



Product description

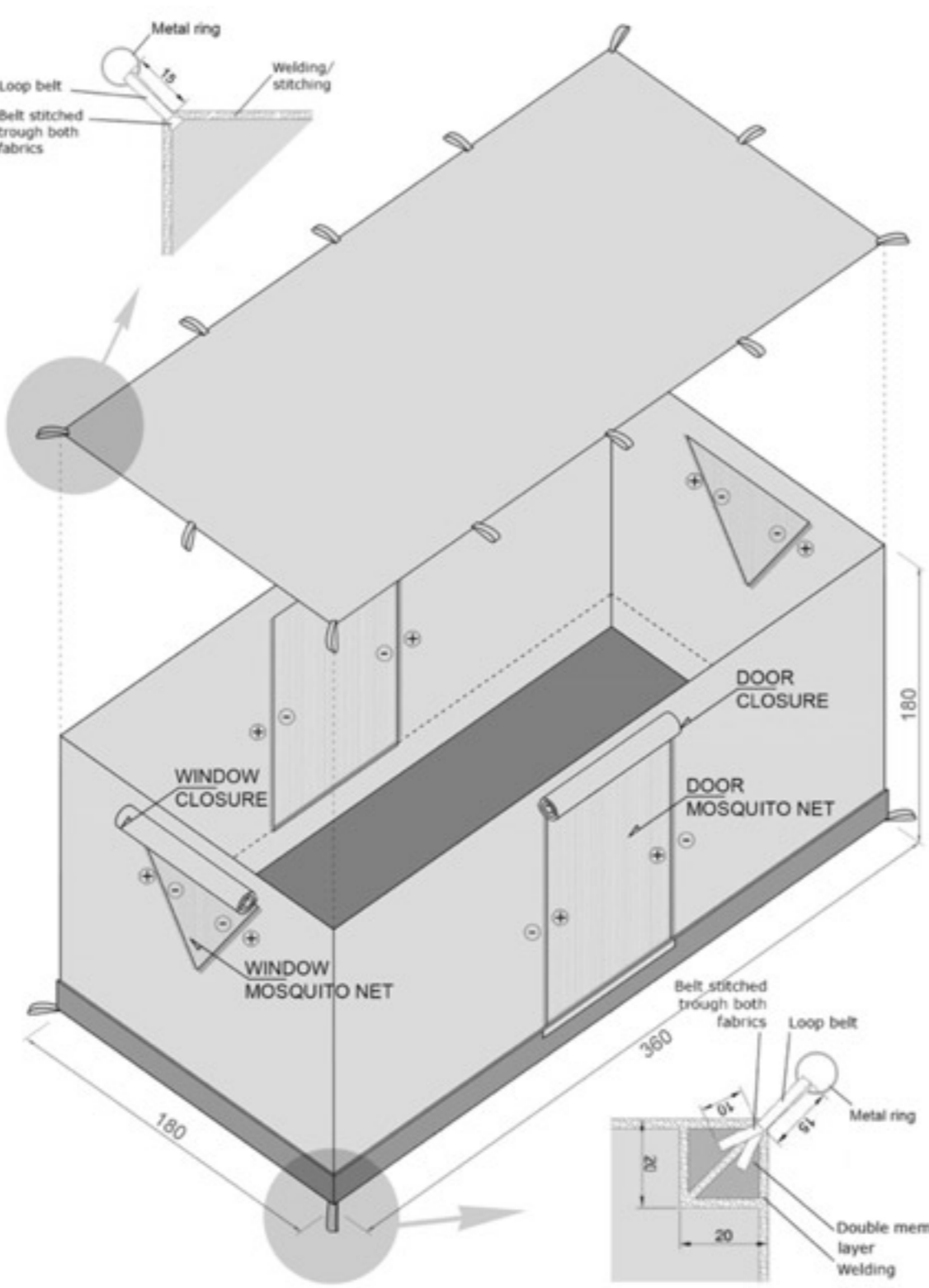
Connections & Useability

The COCOON (Shelter-Type 3) is a living module suitable to be combined with the structural elements of other shelter-kits (e.g. poles of Type 1 - CLEVER ROOF) or also locally available timber. It allows creating a confined space to assure intimacy and protection against the elements. The material is impermeable and lined with an interior felt for thermal insulation of the module. Type 3 kit is delivered in a bag that can be carried on a person's bag.

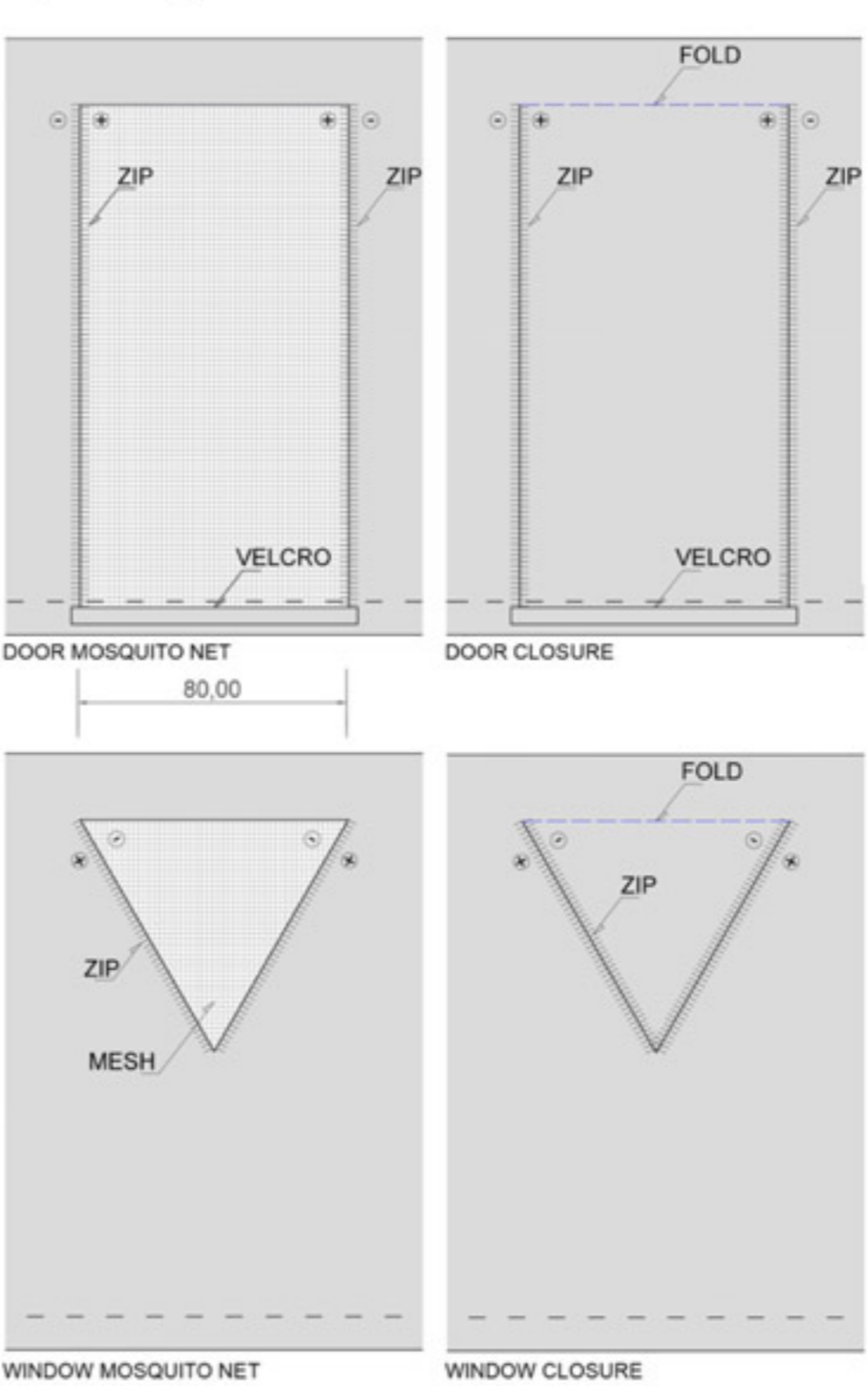
Each module (footprint area: 6,50 sm) provides a first partition system in emergency context. It's possible to close the area below the Type 1 with a maximum of three rooms (footprint area: 19,50 sm). It's also possible to use the COCOON in Damaged buildings or wherever existing structural Elements permit to hang the room by means of Belts provided within the kit.

The COCOON can be used for all climate types. In The case of cold climate, the non-woven polyester of internal surfaces insulates the shelter. It can also be used as winter room in multipurpose tents (e.g. Type 2- MULTIPURPOSE UNIT). In warm and hot climates, the cross ventilation reduces the indoor temperature, while the Type 1 works as shade net.

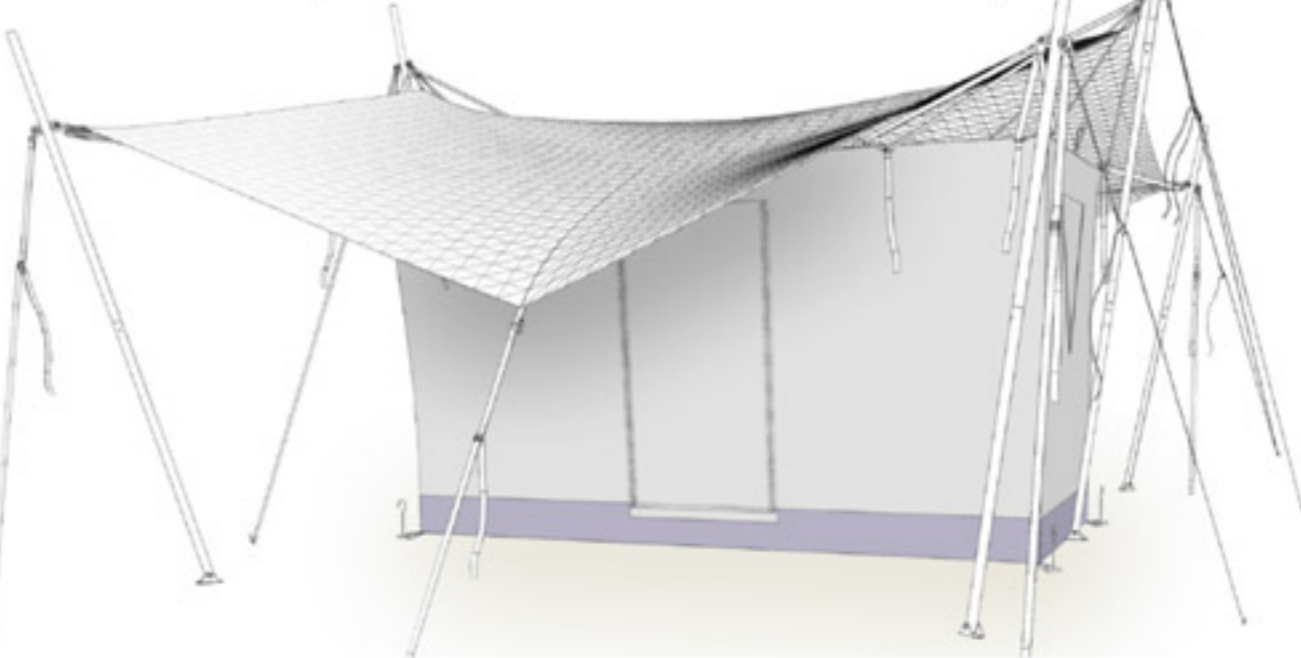
Isometric view



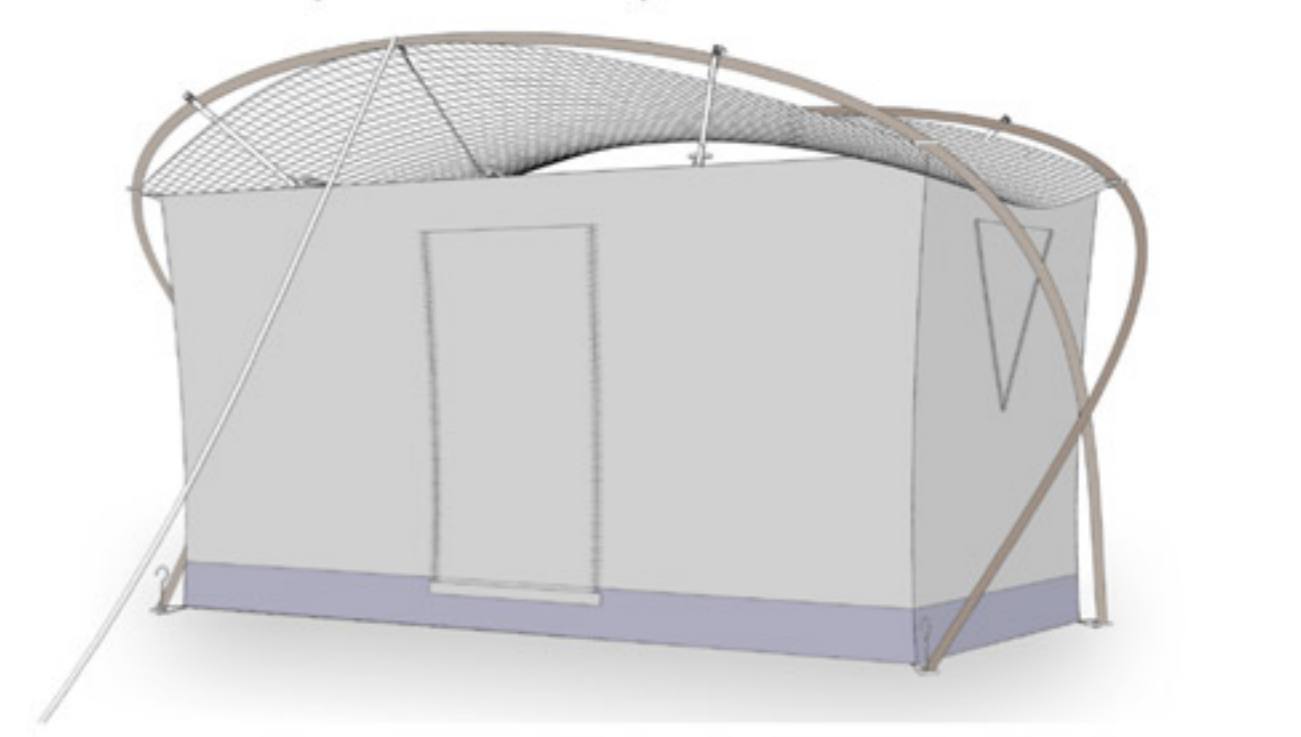
Openings' detail



Connectivity with the T1 - Clever Roof



Connectivity with locally available structure



Field test in Ntiagar (Senegal)



Instructions

Manual & Labels

The set up of the COCOON needs max 30 min. under normal weather conditions with 2 untrained persons. A clear universal manual, the low-tech design and the adaptability to diverse contexts facilitate the assembly stages.

They can be summarized in five phases:

- (i) unroll the COCOON under the Type 1 in correspondence of its central poles;
- (ii) attach 8 short belts with tensioner to metal rings on the top face of the COCOON;
- (iii) place 8 long belts through the shackles of T1 poles and the metal rings of the COCOON;
- (iv) pretension belts by using the tensioners of short belts attached to the metal rings. If only two persons set up the shelter, lift up a short side first, and the other one later;
- (v) anchoring the base though 4 metal pegs.

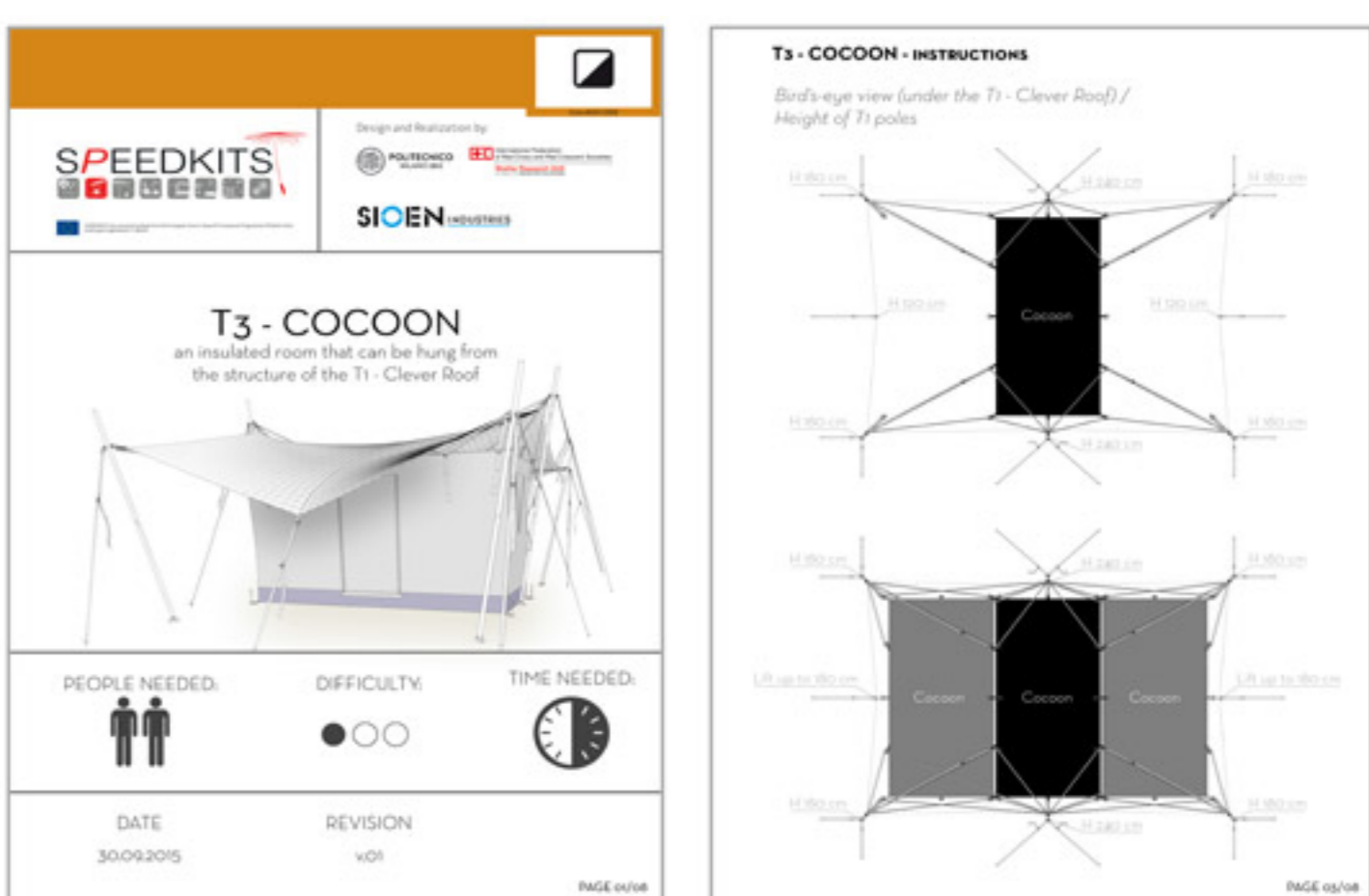
Packaging label



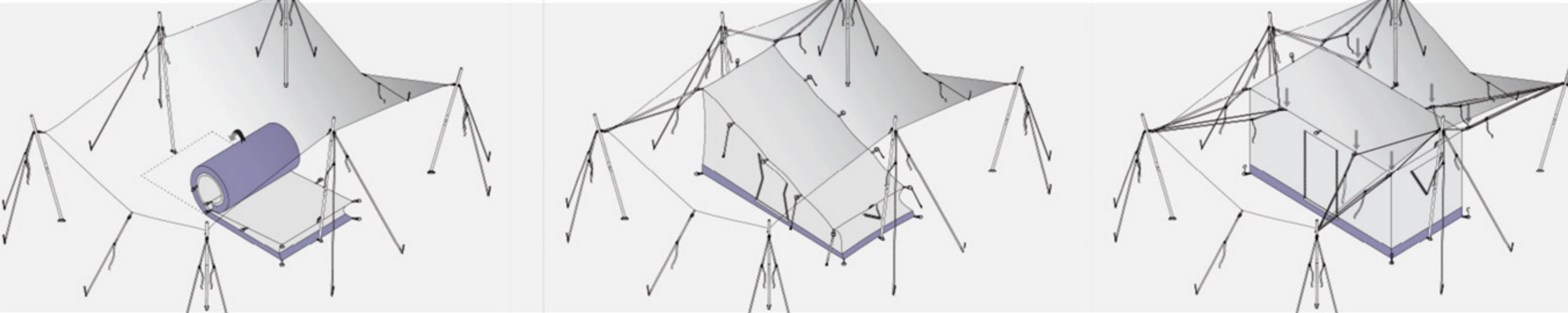
Description sheet



Instruction manual



Assembly stages



The work has been developed inside the research team of Politecnico di Milano: S. Aliprandi, M. Barozzi, A. Campioli, L. Collina, G. Giabardo, C. Monticelli, S. Viscuso and A. Zanelli (coord)