

Constructional system for archaeological mission in difficult access sites

by Diego Capello

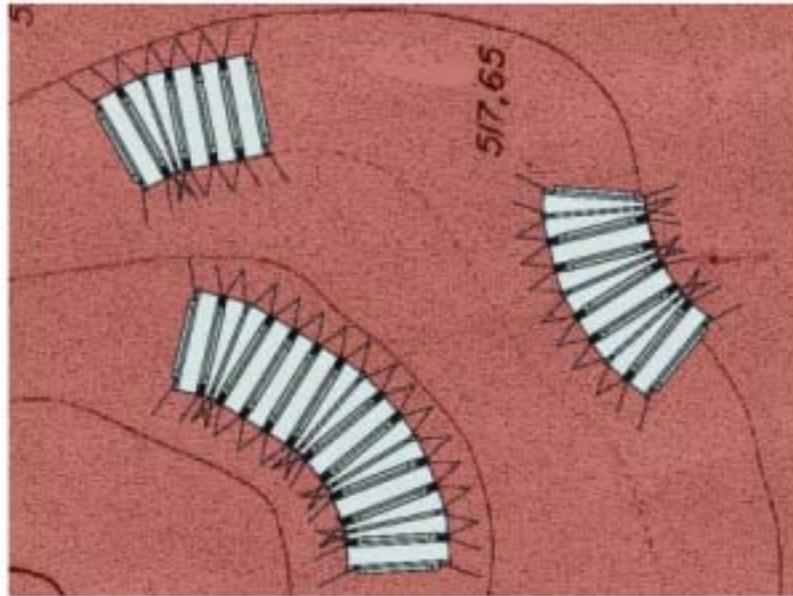
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The study of the past is an activity for which it is necessary a harvest of information. Many times the sites of the ancients – over which the archaeologist has to investigate - came found in difficult accessibility places, because the need of the ancients to exploit the conformation of the territory as natural defense. The job of the researcher becomes more arduous whenever there is the need to leave all the contemporary conveniences to approach to impervious places and skim through and scrape off layers of ground with the hope of seeing the appearing of transitory traces of ancient fastis or simple every day life.

In these cases there is the need to an agile and portable, versatile structure, supporting the people that are about to interpret the traces of the past, in places where the conditions of life are difficult and the accesses few and extreme. Then, the objective is to propose a habitat adjusted for the researcher - but also for all his coworkers - that leaves the progress civilization to effect his search in an area cut up in the territory fabric manipulated from the man. Not always this separation means the transfer in zones totally impervious and distant from the inhabited places - also because such places are scarcer each day on the planet - but it also can be seen as being simply far from the major communication routes. Often, just being out of the beaten track, brings to a circumstance, in which the construction of an archaeological mission, (with all the particular demands to satisfy) becomes a difficult job. Operating in a rural and non tecnologized environment brings to serious difficulties, so, every complication due to the phisical mission construction becomes a further impediment. So transportability and handiness of a structural system become fundamental qualities also in a non extreme circumstance.

This thesis purposes an housing system based on pneumatic technology. Covering and walls are one single element. It is a module made up by two pneumatic arches bearing a coating membrane (Sheerfill membrane: solar energy 73% reflective). The approaching of more modules – which are two types, different exclusively in the height – generates the double height structure that is the living space itself – partible and modular – housing all the archaeological mission activities. Such system is compatible to every territorial configuration.

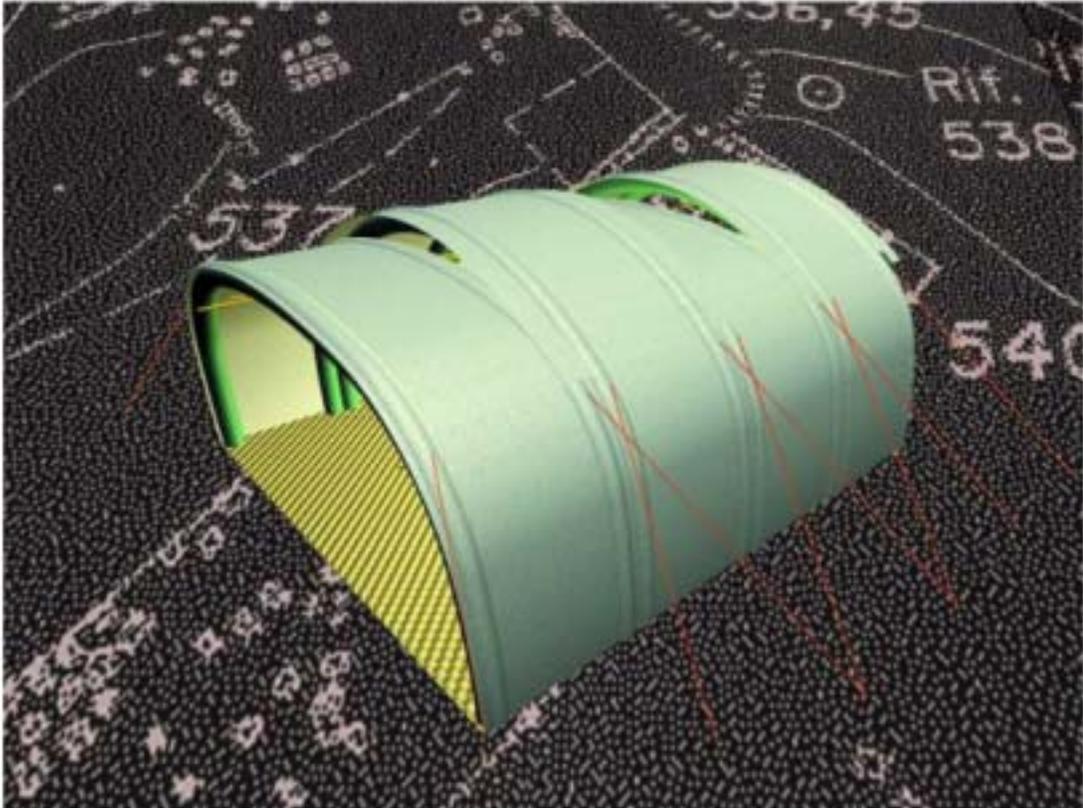


The system ability to fit on the territory

Statically the structure works as a bearing arches sequence, bound to the ground by crossed brace linked to screw pegs.

Every membrane module of the missione structures is beared by a pair of pneumatic arches. The cables, anchored to earth, togheter with the air push, guarantee the right tension, necessary to the good system working. Every module own a strap fabric couple – each of the one linking the arches estremes – which guarantee a chain effect and mantain the arch in the right form. The curvature is generated by the pneumatic arches form and by the membrane lenght, combined togheter they give the right tension.

To complete the system there are also longitudinal bracing elements. Such braces – like plastic fiberglass tent cannules – link and fix the arches by the plant lenght.

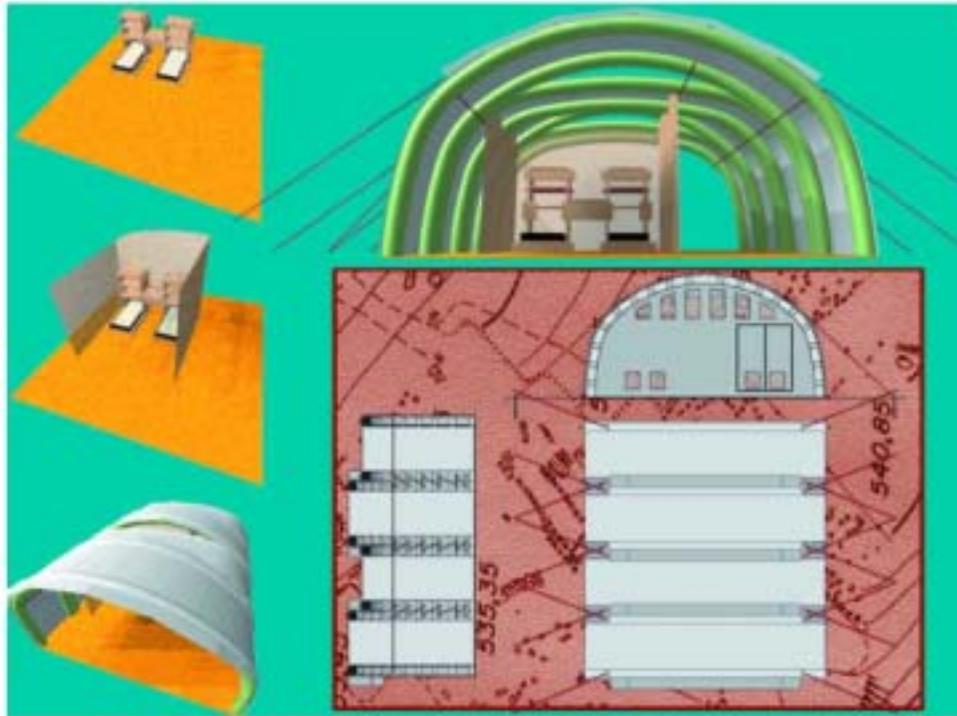


The structural system: the pneumatic arches hold on the membrane, the crossed brace cables, the longitudinal bracing elements. Together they guarantee a static stability

This system is also light and easy to mount: since reaching the site, after choosing the place to collocate the archaeological mission, you can unroll the Sheerfill modules. Every module weights 31 kg and rolls around a 8 - 10 cm diameter. The spread module is 214 cm width and 1040 cm length.

Operation phases:

- 1) two persons hold on the membrane, while two other thread the deflated pneuma and tie them to the Sheerfill membrane without fixing the joints
- 2) while the structure begins to be inflated – operation which takes a few minutes – by a 1,5 KW air compressor, two persons hold the lower limbs in the right position while another fixes the two brace straps and the two longitudinal brace elements
- 3) once the structure is completely inflated and sustained by itself, can be moved and fixed to the ground by simple tent pegs – which don't have really a primary structural function that is sustained by the screw pegs and the brace cables
- 4) the same operations can be repeated until all the necessary modules – to the space needed by the mission activities – become realised
- 5) the modules are jointed together passing in the special loops the 5 mm poliester cable
- 7) the modules are anchored to the ground by the brace crossed cables linked to the screw pegs.



The pneumatic modules work as a coating system. Inside them there is the *housing mobile packaging*, that is composed by modular light cardboard panels and performs as the personal living cell, parted by filter membrane from the rest of the internal mission space

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