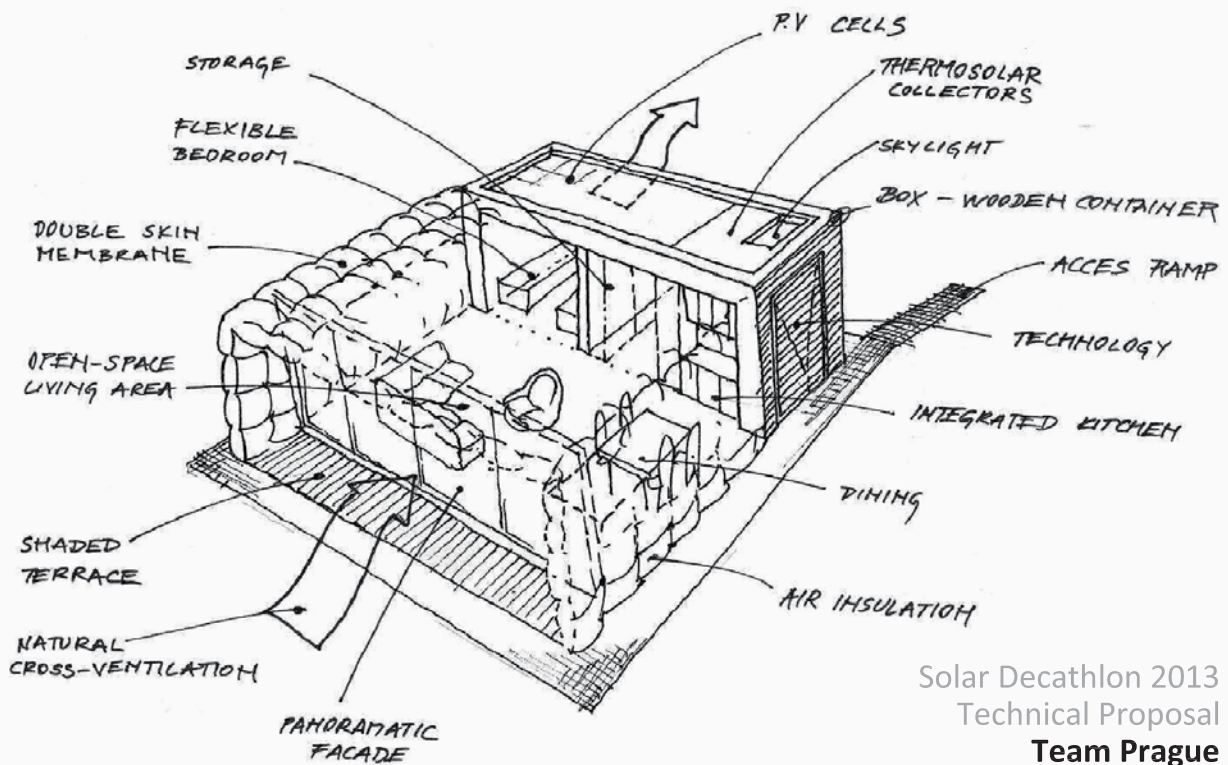




AIR HOUSE

CONCEPTUAL DESIGN



Solar Decathlon 2013
 Technical Proposal
 Team Prague

„A space where the walls, the roof and even the furniture are made from compressed air, ... An environment with a controlled climate where people are free to move in direct contact with the earth and sky...“, that was the dream about “Air Architecture” by French artist and performer Yves Klein in 1958.

The concept of TEAM PRAGUE can be described by two words: BOX – MEMBRANE. BOX in terms of the tradition of prefabricated and mobile minimalist apartments built by the architectural avant-garde of the 20s; MEMBRANE in terms of a load-bearing construction, a high-tech, intelligent architectonic skin.

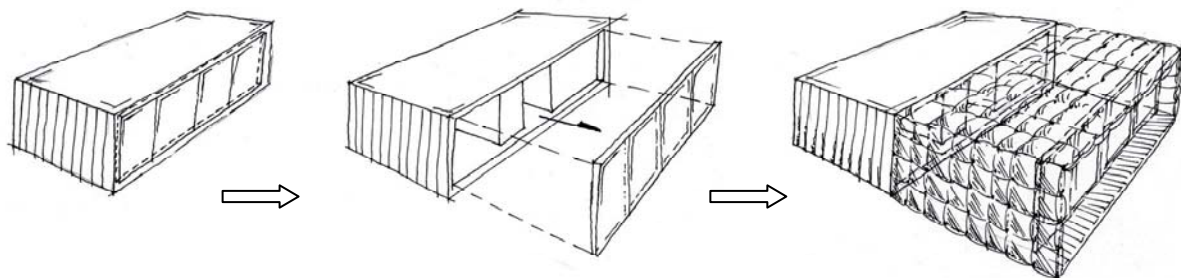
The floor-plan is clear and functional. In the BOX there are integrated technological and hygienic units. It can be easily transported due to proportions designed to fit ship container dimensions. PEFC certificated massive wooden panels are used for the structure, sheep wool is used for thermal insulation.

The light MEMBRANE contrasts with the wooden BOX – it is the architectural skin. The MEMBRANE is constructed to diffuse light, produce electric energy, and provide shading. Self supporting cushion structure from the ETFE membrane is designed as a double façade. The air within the façade can be pre-heated or pre-cooled according to weather conditions. Thanks to the translucent quality of the MEMBRANE the maximum use of daylight reduces the energy consumption for lighting. Above all it offers a new and unusual connection with the surroundings of the **AIR House**.

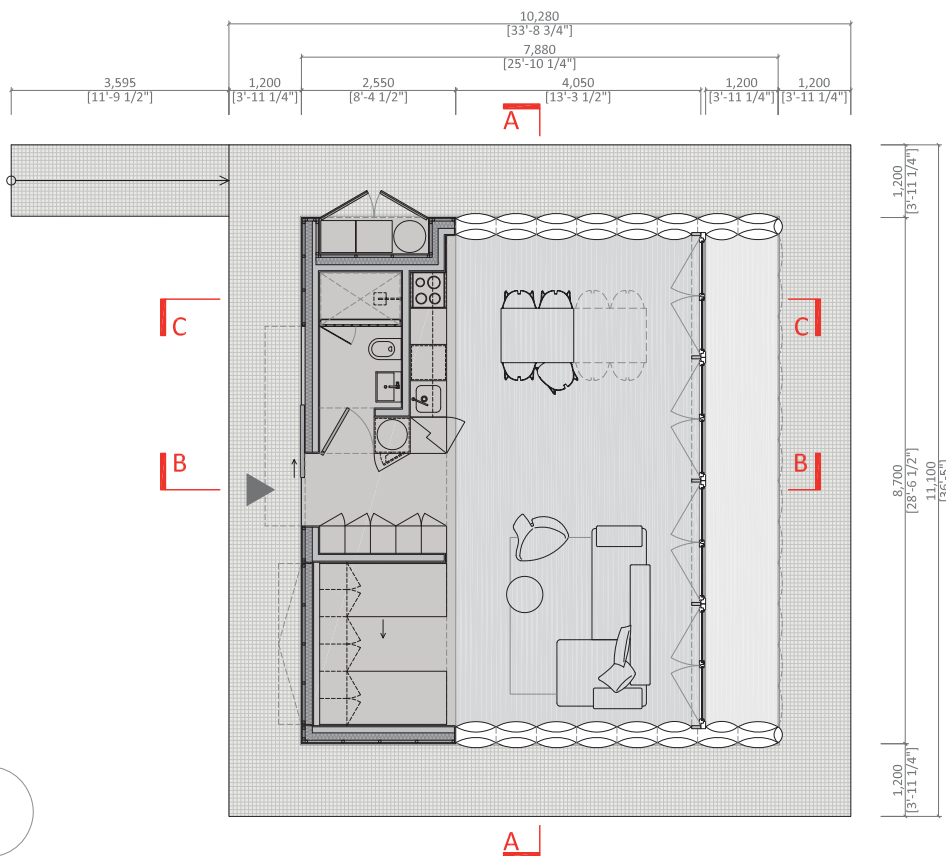
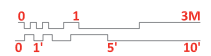
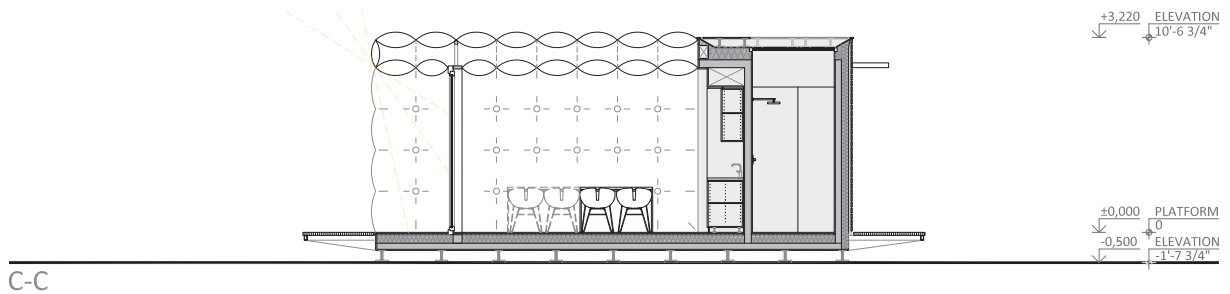
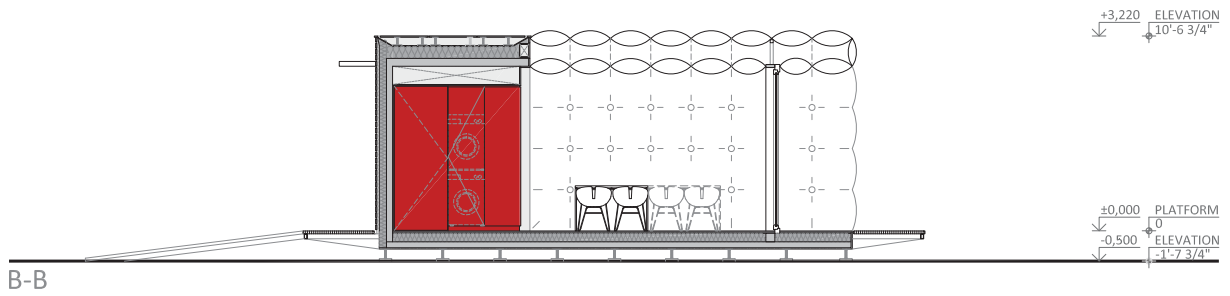
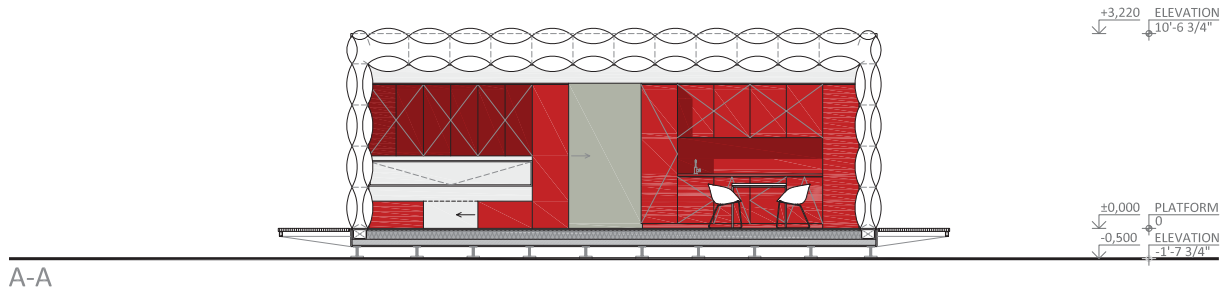
AIR House uses the passive (orientation, compact shape, window openings) and active systems. Photovoltaic panels and vacuum sun collectors are set on the BOX roof, PV panels are also integrated into the MEMBRANE. The output of PV panels is calculated for the needs of the **AIRHouse** and an electromobile in addition.

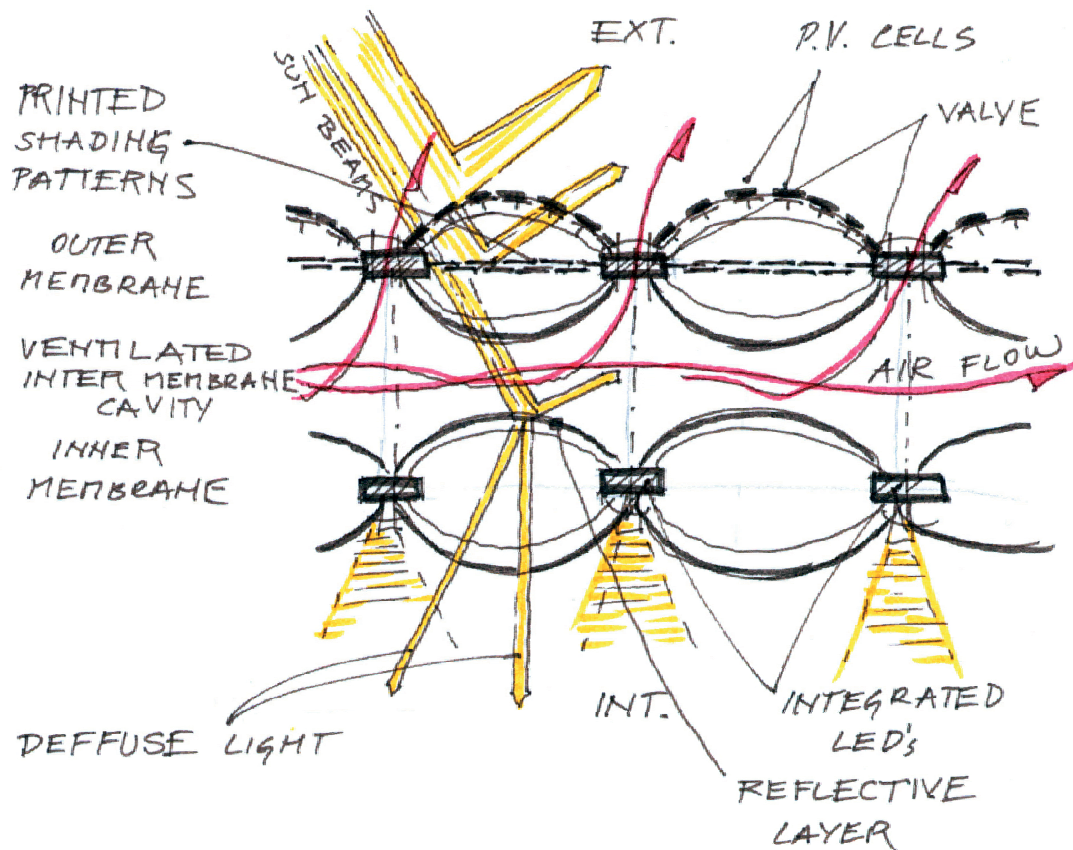
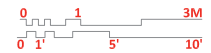
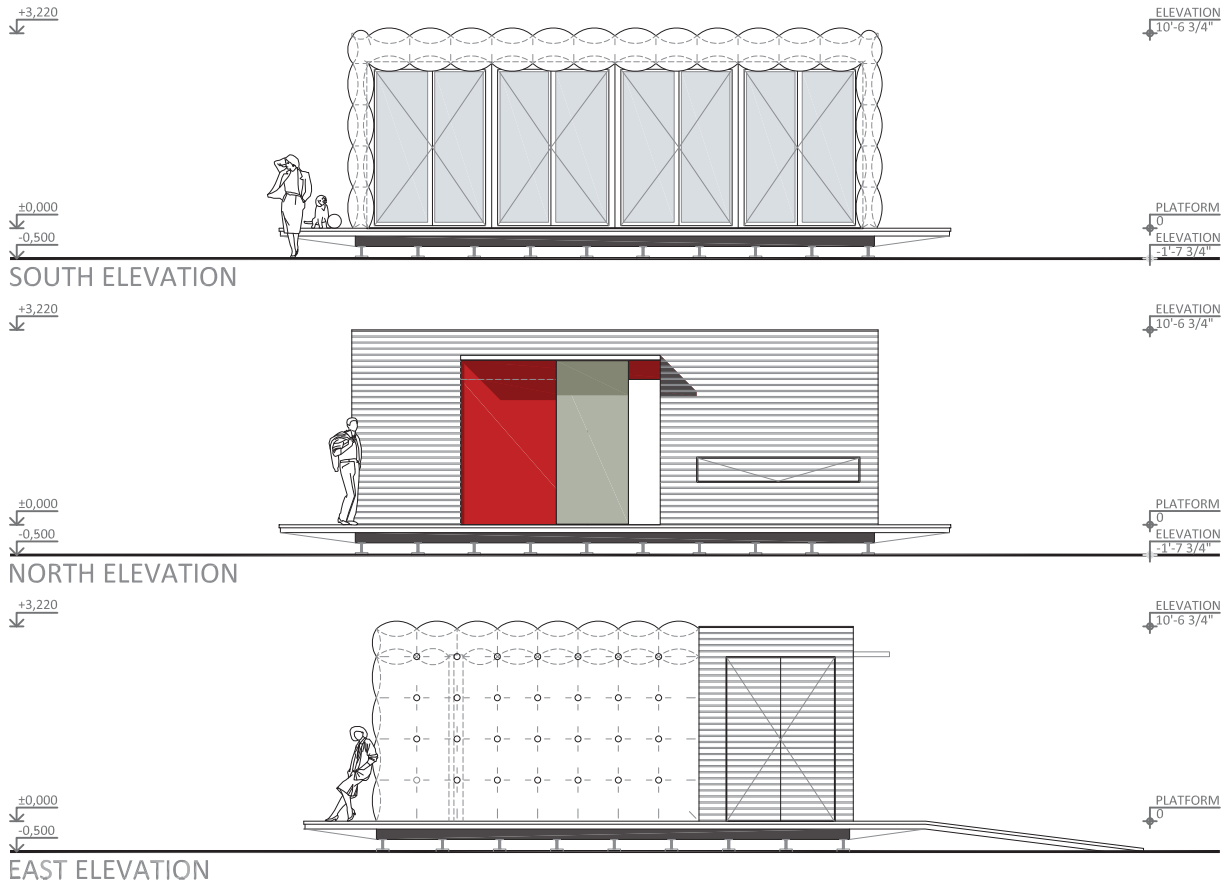
The printed reflective pattern on the MEMBRANE provides shading of the house, it’s density varies according to the house’s orientation. To keep in touch with nature, the house is cooled with natural cross ventilation provided by windows in the south and openings in the north façade. The massive wooden floor helps to balance thermal and humidity conditons naturally.

The ETFE membrane we use is 100% recyclable, and other materials have also been chosen in the spirit of cradle to cradle philosophy. Natural materials will enhance the quality of the internal environment and will pleasingly affect the human senses.



The brilliance of BOX-MEMBRANE lies in the low mass of the house, its compactness, easy transportability and quick construction. All you have to do is unfold and inflate it. It can be used everywhere where time, site limitation and of course money are the main concern. We think of a young couple building a house in their parents’ garden or of retirees, who give up their house to their children. It can serve as temporary housing in case of natural disasters or as a weekend cottage in places that are difficult to reach. Above all the house will be a prototype of unique solar and air architecture in which innovative architectural elements and technologies will be presented.





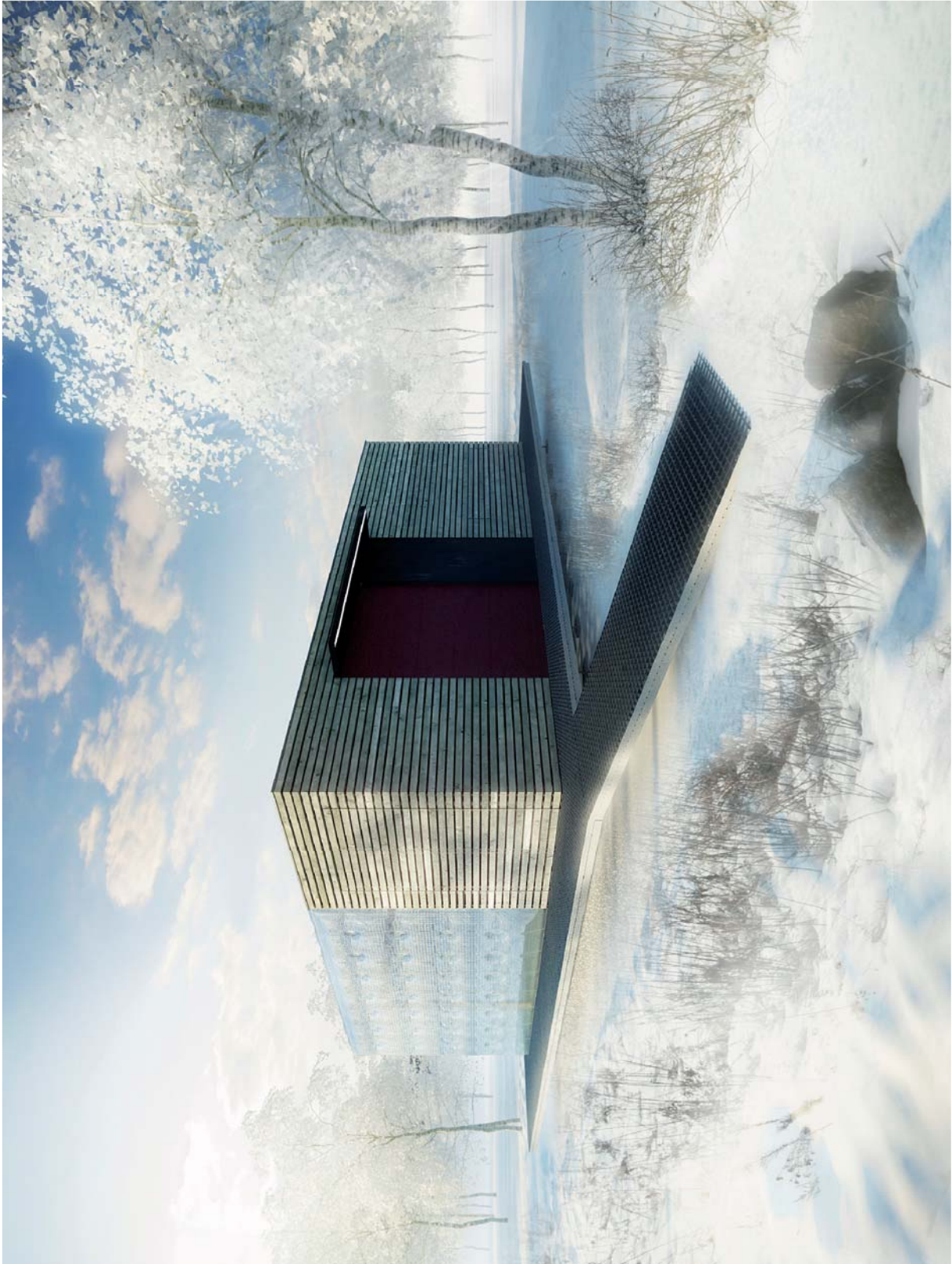
SCHEMATIC MEMBRANE SECTIONS - CONSTRUCTION PRINCIPLES



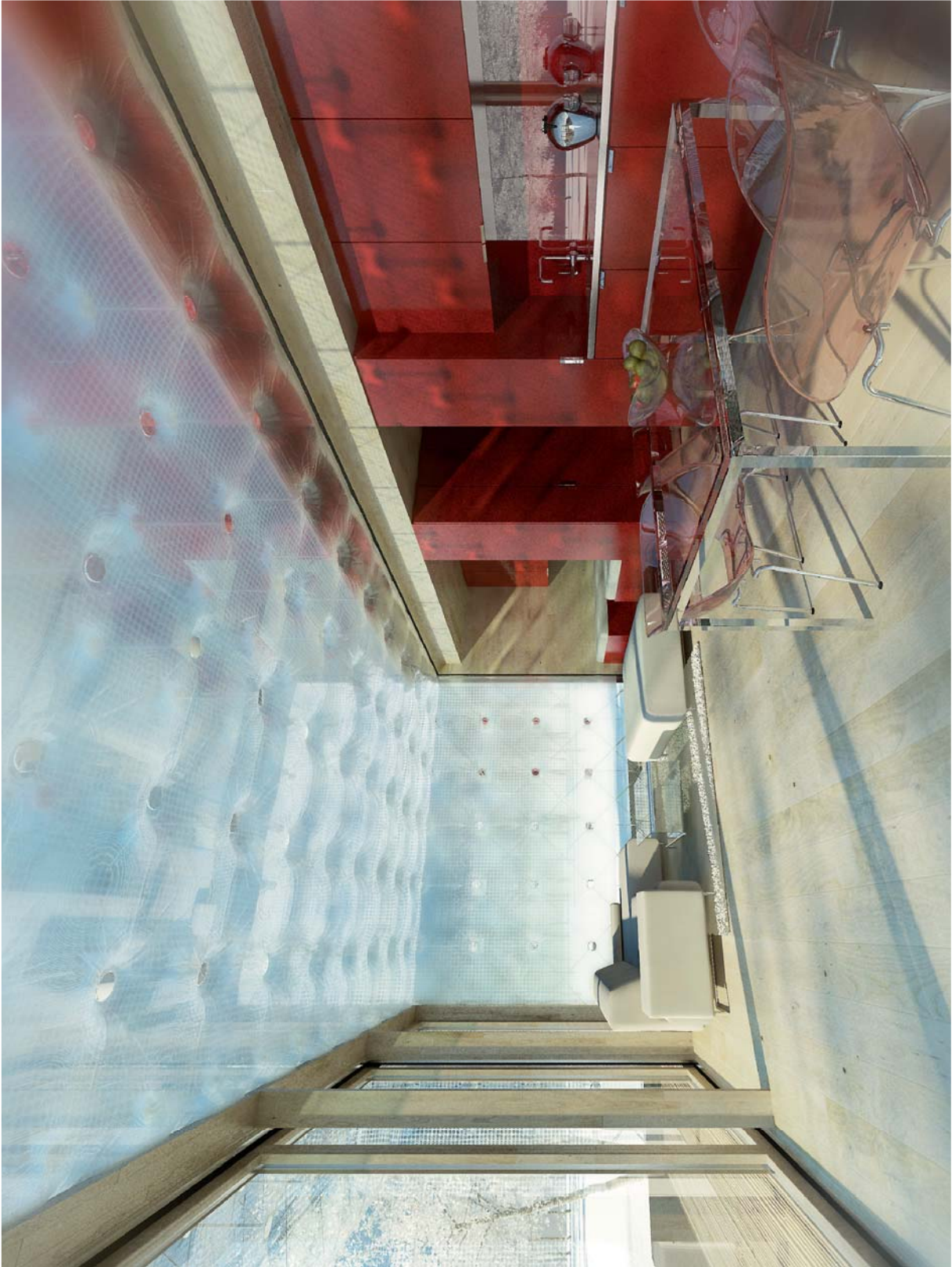
PERSPECTIVE VIEW FROM SOUTH EAST



PERSPECTIVE VIEW FROM SOUTH WEST - NIGHT



PERSPECTIVE VIEW FROM NORTH EAST



INTERIOR