**Symbiosis**

Part I

Nevada is a land of extreme conditions where a desert climate reigns supreme offering an incomparable array of geological formations and wildlife. Range of temperatures in the Nevada deserts is as wide as -45 to 50 ºC. So extreme life conditions were not an obstacle for civilizations like the Tuaregs in the Sahara Desert, who live and adapt themselves accordingly the wildlife, reaching a respectful approach with the environment and forming communities. Here is where ``Symbiosis´´ concept between community and environment was derived of. In this respect, Symbiosis is defined as a union for mutual life of an organism and an environment based on reciprocally benefit so, architecture provides shelter and protection to the users and they provide life and a purpose to the installation creating a community.

The intention of this proposal is to provide a flexible and sustainable product that can shelter all kinds of experiences in Fly Ranch guided by Burning Man culture. The sustainable design of this product is concerned with maintaining quality of life by assembling prefabricated elements and respecting the natural environment by not altering it. This concept developed in an ephemeral prospective will claim back the works of nomadic cultures.

Fundamental in this proposal is that the design responds to the real temporary need and can be easily installed, enjoyed, and dismantled without leaving any trace over the ground. The spot returns to the origin as it was before. The proposal looks for the generation of a community with a minimalistic and modular architecture in the form of a circular installation reminding the ephemeral condition of the Burning Man event, where all type of hierarchy is eliminated by placing the attendants along the perimetral stripe and putting in the focal point, sun light and local vegetation. The installation grants to the users sufficient electric energy through photovoltaic solar cells and at the same time, protection against direct sun radiation.

The architecture provides shelter and protection to the user, the user gives life and purpose to the installation creating moreover an indispensable bond between man and nature. The different levels in clear height provides flexibility and generates contained spaces, allowing that all kind of activities happen under it, bringing a common space to people of different ages, different origins, different beliefs so they can create the Fly Ranch Community.

Meanwhile the relation between man and architecture is symbiotic: architecture benefits of the user and this one benefits of architecture, the relationship between man and nature is given by respect towards nature and elements such as the cover that thanks to its materiality reflects the surrounding vegetation in it brings nature and its beauty into the project, generating a higher conscience in the user regarding his environment.

Also, thanks to its modular and prefabricated architecture, Symbiosis is easy to transport, easy to repair and easy to assemble. In the same way, once the installation is no longer needed, it can be easily disassembled, transported, or even recycled. All this possible for its low-cost, eco-friendly, and replicable design.

To take advantage of one of the best local conditions: great solar radiation, Symbiosis’ cover is made of OPV or Organic Photovoltaic cells in ASCA® film produced by Armor. The lightweight, flexibility, durability, and efficiency of this product, make it suitable to this application, besides the fact that it can be personalized with its coating’s variety. ASCA® film is made out through a low-carbon process with organic raw material without any toxic component, 100% recoverable. It is an extremely thin, light weight not self-inflammable material (450 g/m2) and flexible for easy winding on curved surfaces with stable performances in high temperature climate.

Technical characteristics:

Transparency: Until 20%

Power: Until 40 W/m2

Max Voltage: Approx. 0.6 V per strip

Max Current: 450 mA for 1 meter

Operating temperature: -10 to 60 ºC

The ASCA® photovoltaic film is an innovative technology, environmental and economic friendly use of resources and space, and modern architecture. The idea behind the use of this product was to consolidate the important aspects of life quality and sustainability in the fields of architecture and design because of its integrated, virtually invisible systems based on Organic Photovoltaic, which make use of surfaces that are not accessible to classic PV technologies.

The produced energy will be stored in a battery pack located at the base of the central column assuring moreover a higher stability to the installation. The proposed solution is a Lithium Iron Phosphate battery pack that shows good performance/price relation against Lead and Saltwater competition. This LFP battery shows more energy with less weight, shortens charging periods, up to six times life than others type, very small loss due to heat development and higher continuous power available. The chosen product is a Battery-Box Premium LVL to meet the project requirements. It is a scalable from 15.4 to 983 kWh capable of High-Powered Back-up, Off-Grid Function and capable of additional batteries in parallel to expand system.

On the other hand in terms of functionality, the flexibility and inclusive design provides the space for any activity to happen such as: camping, cooking, nature’s observatory, dancing, drinking, art making, cinema, theater performances, all sort of games, partying, bicycle parking, you name it. And in terms of operability, the photovoltaic system does not require any specialized people. Solar panels generally require low maintenance to function and need basic periodic cleaning of dust that could obstruct the sun’s rays. Once the installation is assembled, the system works autonomously, and no special operation is needed. The modular prefabricated architecture makes any repair or substitution of any part or accessory easy to perform. Based on the technical characteristics of the product and OPV cover area (588 sqm.), each Symbiosis installation is expected to produce:

565 kWh per day or 206 MWh per year.

In terms of materiality, the structural elements are aluminum tubulars: lightweight and facilitate assembly and disassembly operations, no problems of rust and easily connected and disconnected mechanically without any welding operation. Symbiosis’ parts are articulated and retractable in order to be transported easily and to fit more Symbiosis boxes in a shipping parcel so the carbon emissions can be reduced even more.

The solar cells are hexagonal elements made of organic raw material without any toxic component, 100% recoverable. The element is extremely thin and presents an exceptionally lightweight not self-inflammable material (450 g/m2) and flexible for easy winding on curved surfaces with stable performances in high temperature climate. Symbiosis installation’s main dimensions are:

Central column height: 16 m. – OPV cover height: 5 m. – Diameter: 24 m.

With a conceptual cost estimate of:

Aluminum – 351 kg. – USD 700

Steel wire – 193 kg. – USD 96

OPV – N/A kg. – USD 44100

Battery pack + Inverter – N/A kg. – USD 8000

Miscellaneous – N/A kg. – USD 300

Total: USD 53196

Strategy: to build up a team multi-disciplinary with expert people in design of light dismountable structures, photovoltaic system for electricity generation and logistics (mounting, working, and dismantling). The possibility to do a joint venture with a local architecture firm could be discussed.

Part II

Architecture has always an impact in the environment. The key is understanding how to reduce such impact to the minimum or even making it equal to zero and to achieve that we can apply the important lessons ephemeral architecture gives us.

The Burning man leaves us some important lessons about how to make community with its great potentials to generate spaces to be used in so many different ways: to celebrate, to sleep, to eat, to play, to talk. All this with the lowest impact on the eco system with ephemeral architectures and a clear and functional installation.

Symbiosis resumes all these lessons succeeding a zero impact in the eco system since there is no need to any intervention on the ground with excavations, not leaving any residual on the spot. The installation will be simply supported on the ground thanks to its stability granted by its geometry and very low barycenter.

Due to its modular and fully transportable architecture, it will be allowed to install and uninstall the system without leaving any evidence of its presence in the ground

In this case Symbiosis can keep only a POSITIVE impact in the environment since beyond not affecting in any way the eco system, it is a source of renewable electric energy with its photovoltaic elements, storing all kid of social life, celebration and shelter. All this with the purpose to create a community in a respectful and symbiotic way regarding our already threatened eco system by forming a positive conscience in people.