## Optimized Photovoltaic Array

A solar panel array on one side of the vehicle will generate power for the workshop. By adjusting the angle (a 36 degree tilt being the ideal angle for Nevada), and stationing the vehicle at the right position, the optimum conditions for maximizing solar gain can be easily achieved. As drawn, the 8 panels can produce an estimated 2.56kw per hour. Additional solar panels can be added as power consumption requires.

## Mobile Workhorse

The Hatchery is inspired by a Burning Man favorite: the art cars. Drawing from this unique and contextual precedent, the flexibility afforded to a mobile workshop means that The Hatchery can build locally at any project location in Fly Ranch. Additional carts can be chained up as other needs arise. To maintain 100% carbon neutrality, the train of machines can be towed by a bio-fueled vehicle or another 100% sustainable fuel source.

## Battery Storage

Solar energy is efficiently stored in a battery pack for later use.

## Rainwater Harvesting

An on-board rainwater harvesting system collects water in a series of fabric funnels and hoses to be stored in collection barrels. This rainwater can be used for general washing and as needed in part of the thatch dying process. Gray water can be stored and later filtered at a dedicated site. As currently drawn, the system has ability to capture 89 gallons of water for every 1" of rainfall, and a 165 gallon storage capacity. Rainwater collection is optimized when the solar panels are in the stowed (vertical) position, and additional storage barrels can be added as required.

## Auxiliary Workshop

With storage for all required carpentry and construction tools, as well as a large adjustable work surface, the workshop becomes a center for skill-building and knowledge-sharing between makers and doers.

## Waste Management

The on-board wood chipper turns waste offcuts from the CNC process into sawdust that can be used for a wide variety of other useful purposes: such as insulation, mulch, animal bedding, heating, and fuel. Supporting The Hatchery's environmental goals, the chipper is fully powered by bio-fuel.

## Bioplastic Canopy

Made from materials that are natural and abundant, the canopy's bioplastic skin is created without the use of petroleums typically found in commercialized plastic. The hardened skin is waterproof, while being biodegradable upon the end of its useful life.

## CNC Machine

A high-efficiency CNC machine and router processes flat raw material into 2D and 3D shapes, with high speed and accuracy. With redesigned electrical control systems for maximum efficiency, the machine can run on about the same power it takes to run a blender, and is the core technology behind this proposal.

## Sustainable Plywood

100% Certified FSC (Forest Stewardship Council) plywood is the primary material used in this proposal. Grown in sustainably managed forests, FSC plywood is sourced regionally and is formaldehyde free. Plywood is known for its strength, durability, and budget-friendly economics.



SUSTAINABLE LIFECYCLE

GROWTH

**Trees absorb C02 while they grow in FSC forests.**

100% FSC plywood creates a long-term carbon store at Fly Ranch, helping to reverse the effects of climate change.

TRANSPORT

**Regional wood is shipped in zero-emission vehicles.**

On-site, construction avoids the use of polluting and high-energy materials.

CONSTRUCTION

**Sawdust, a CNC byproduct, can be reused.**

Sawdust from unused plywood becomes insulation, mulch, and more.

REUSE

**At end-of-life, Fly Ranch structures are adapted.**

Plywood is reused or recycled, helping Fly Ranch combat global warming.

## Skin of Dyed Thatch

The distinctive exterior cladding is created using dyed thatch, forming a rain-screen roof made entirely from the grasses found at Fly Ranch. This technique draws inspiration from the indigenous technology of the region's forefathers. The Paiute Tribe created "wickiup" shelters made with thatch from branches, sticks, and grass.

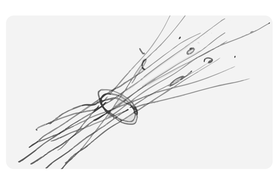
Taking this technology one step further, with the aim of not attempting to copy or appropriate this cultural history, this project proposes to dye the grasses in all-natural dyes and create a "skin" that draws from the colors, patterns, and texture of the landscape's outstanding natural beauty.



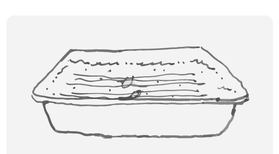


Paiute Tribe "wickiup" shelters, built with thatched exteriors.

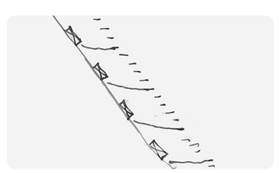
**1** Abundant native grasses found throughout Fly Ranch are cut and thatched on-site.



**2** The thatch is packed into "yearns" — workable bundles that ensure the brittle material does not break during construction.



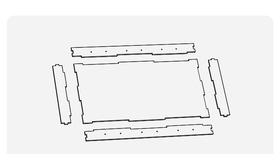
**3** The yearns are dyed using natural, non-toxic pigments, such as Orange Ochre, Mayan Turquoise, and Emerald Green.



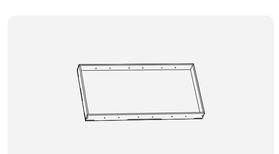
**4** Thatch is fixed onto timber purlins across multiple layers. The complete structure creates a visually distinct and weatherproofed exterior to clad The Hatchery.

## Structural Modules

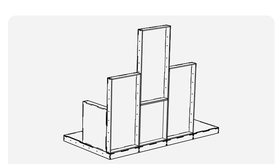
Using digital processes, The Hatchery's design-and-build system enables the on-site creation of unique modular buildings across Fly Ranch.



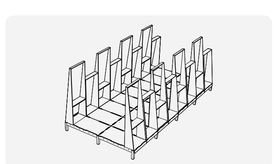
**1** Cut from a flat raw material, the instructions for creating structural chassis members are drawn on the computer using a digital model.



**2** To create high-performing shelters, the inner cavity can be packed with wool, straw, and sawdust (a waste material from this process) to produce insulation.



**3** Modules can be easily handled by just one or two people and bolted together to form a solid structural frame.



**4** The system can be adapted to create any shape and size structure imaginable: facilitating construction initiatives across Fly Ranch.