Fly Ranch Sky Villages

The ruggedly beautiful and nearly unbuildable fly ranch terrain needs an architecture that is as unique as its landscape, like sculptures you can live in. Our dwellings rise above the ground on pylons making them appear to have grown from the earth. Raising the village adds to its beauty and protects citizens from the harmful environment, and keeps the environment safe from its residences. These dwellings will protect villagers from insects, snakes, and rodents, as well as other natural hazards like floods and fire, while allowing flora and fauna to thrive undisturbed on the land below. To accomplish this, we have developed a new construction system based on a rarely used dome geometry. This geometry will allow the construction of all dwellings using simple and cheaply made identical precast panels that are then bolted together. These building block panels will enable the creation of an unlimited variety of dwelling configurations. As the community expands, domes and pods will be tethered by a network of elevated walkways and a revolutionary monorail bicycle system we are developing. These two technologies allow construction over jagged rocks, hills, uneven ground, marshland and even over water. Land that has severe development potential can now be usable.

Dome and pod dwellings

Our proposed dwellings are based on the Rhombicuboctahedron, which is a ruggedly artistic dome geometry that allows easily scalable domes and pods to be quickly and enexpensively constructed from precast sectional panels. These panels reduce construction time to just a few days. The creation of these panels will be achieved using a new concrete mixing technology that creates a material called Aircrete. Aircrete is formed by mixing ordinary cement with biodegradable foam to produce a castable cement filled with air pockets. Aircrete expands concrete, requiring only a fraction of concrete to fill the same volume and can actually float on water. Since these panels are cast, unique forms and textures can be added to the molds, which will allow for an unlimited variety of dome appearances adding to the sculptural beauty of the dwellings and villages. Aircrete is also insect-proof, fireproof, soundproof, and a highly efficient insulating media ideal for harsh environments. Steel is used to reinforce Aircrete panels, the floor bases, and supporting pylons providing plenty of strength for these structures. Pretests have proven this geometry can withstand winds over 144 km with no ill effects.

Example design uses are:

Duplex dwelling: A two-level home using a base dome with a pod addition attached.

Pods: These are elevated homes supported on pylons built on any terrain in any environment.

Greenhouses and Aquaponics: Large pods with top panels of glass or plastic to create greenhouses on the top half of the pod, allowing for the lower Aircrete portion of the pod to be filled with water for the ability to farm fish. Water from the fish pond will provide natural fertilizer for the greenhouse plants.

Monorail bicycle and solar walkway

Roadways are a major destructive force on the environment. They leave trails that cause erosion as well as interfere with the animal right of way. We propose a monorail bicycle track network that will be elevated 2.1 meters or more above the ground to eliminate roads. This track will supply year-round access to all villages and developments of the Fly Ranch property and unobstructed passage for cattle, deer, wild horses, and other animals to pass underneath.

Monorail bicycles are not new, and our version is a modern adaption of the Hotchkiss bicycle railroad of 1892, which ran on a wood rail and had some issues that led to its demise. Our version of the bicycle railroad will run on elevated steel tubes using a newly designed bicycle based on a recumbent design. Our monorail bicycle will grip the track, much like a modern-day roller coaster, except that it can be removed or attached anywhere along the railway. Although mainly pedal-powered, monorail bicycles will also be electric assist and draw energy from solar panels mounted in the middle of the monorail tracks. Monorail track networks will tether all the domes and pods, adding stability to the villages and access to all parts of Fly Ranch. Tracks will consist of three major types:

1. The main inner-city monorail track is a two-way traffic system using two widely spaced railways elevated at 2.1 meters above the ground. The space between the two rails will have a solar walkway made of walk on solar panels made by Sunpower for pedestrians. These panel arrays will supply power to the monorail bicycles as well as the villages. The track pylons will also support water, waste, and electrical conduits below the solar panel walkways eliminating the need for trenching utilities.
2. A two-way monorail track without the pedestrian walkway. These will be used for the long spans between all the different fly ranch developments, thus providing safe and fast 24-hour transportation in any weather condition. The narrower profile will help blend the tracks into the landscape and reduce the number and size of supporting pylons. This track will be at an average height of 2.2 meters or more above the ground, allowing nature to roam free below.
3. A single one-way track explicitly designed to pass around geysers and ponds that provide access to all the beauty of fly Ranchs hidden from view of boardwalks and pathways. This track is for recreational, educational purposes, and tourism.

Honorarium

This honorarium will provide for fabricating and installing one duplex dome shelter that consists of a 3.2 meter base dome and one attached 3.2 meter complete pod on support pylons. The dome height will be 2.4 meters and the top of the pod height will be 4.6 meter. We will also provide 30 meters of the dual-track monorail and one monorail bicycle to test and fine-tune the Monorail bike designs.

Honorarium order of magnitude expenses:

Hours 90 - 120 ( Some private funding and volunteer) $ 7,000

Raw material cost $28,000

Transportation cost $2,000

On-site, construction cost $1,000

Total $ 38,000

On-site work summary:

Prefabrication of the monorail, Aircrete molds and monorail bicycle will be performed off-site. All dwelling Aircrete panels will be cast on-site at Fly Ranch. After the panels are cured, we will assemble all panels, complete the dwelling and track, as well as test the monorail bicycle.

Honorarium completion on-site at Fly Ranch is 30 days.

Materials and technologies required for honorarium are:

Aircrete: Concrete and biodegradable soap using proven mixing equipment and technology.

Steel tube: Tubing used for pod and dome base structures, monorail track, and pylons.

Crushed rock: for under dome foundation unless short pylons are used.

Bamboo: flooring.

Polycarbonate: window material.

Input and maintenance:

Once correctly complete, the Aircrete shelters will last hundreds of years without maintenance. The solar walkway will need periodic cleaning and snow removal to maintain power production. The steel pylons may require rust prevention but should also last over a hundred years. If stainless steel sleeves are used, the pylons may last indefinitely.

Output:

Solar walkways will be semi ridged walk-on marine PV panels by Sunpower and produce 18 watts per square foot with an expected lifespan of 15 years.

The structures and systems will produce no waste during use at Fly Ranch.

Village use and organic expansion

We will build the new Fly Ranch community's first structures, but the actual village builders will be the residence themselves. We propose that this expansion grow organically. Every resident staying, learning, and living at Fly Ranch will need to supply basic tuition. The money from this will purchase all the raw materials required for students to build and complete the dwelling they will stay in during their time at Fly Ranch. These students' first lessons will be how to fabricate, weld, cast Aircrete, and ultimately construct a pod home. After learning these essential skills taught by the Sky Village crew, the residence will know how to build their own pod dwellings when they return home. After leaving these unique pod homes behind, the newly vacated homes can then be repurposed for many activities such as art studios, yoga pods, meditation domes, Airbnb, and other short term tourism housing. Pods can also be used to house infrastructure and equipment such as water processing and storage, grain mills, coffee roasters, and the like. Every time a new resident arrives, a new pod or dome will be added to the fly ranch cities until the city is complete, and the dreams and goals of the fly ranch management are achieved. Everyone participates in creating the village architecture of Fly Ranch.

Environmental impact report

We have placed a great deal of thought into creating a dwelling capable of providing comfortable living in rugged environments while leaving minimal to no impact upon those lands. The domes and pods presented here are bolt-together systems that allow construction in just a few days, last maintenance-free for hundreds of years, or be removed entirely in a few days. They require very little to no site prep due to the use of pylon supports. The pylon supports leave small post holes in the earth. If the pylons are removed and the holes filled with soil, only a tiny mark on the landscape will show and will quickly be reclaimed by its surroundings. Most transportation and human activities will be high above Fly Ranches' fragile landscape, and these dwellings assure that nature is protected below.

The primary materials used for the construction of these villages are concrete and steel. These are natural materials and are infinitely recyclable. Most of these building materials are already sold as recycled material, giving these dwellings a low carbon footprint from the start and allowing the entire residence to be recycled if needed. Panelized components of the construction process for these shelters provide the ability to unbolt, relocate, or reconfigure these structures at any time without the need for demolition or heavy equipment. The ability to repurpose and relocate domes and pods reduces waste and purchase of new building materials making these structures incredibly environmentally friendly.

Our bicycle railroad will provide additional protection to Fly Ranches ecosystem as hundreds of people will be able to completely traverse the entire Fly Ranch property without setting a foot or wheel on the soil. If this bicycle railroad ever needs to be decommissioned, the rails and pylons can be pulled, the holes filled with earth, and nature will return within a few months.

Greenhouse Aquaponic pods won't impact or displace surrounding fly ranch ecosystems due to it being a closed system that is raised above native soil. Fish ponds in the lower section of these pods provide water storage and natural fertilizer produced by the fish. This mineral-rich water is used to feed plants grown above. The plants purify the water and return it to the fish ponds, creating a natural biosphere that allows for food production without artificial fertilizers or environmentally destructive agricultural water runoff. Aquaponics eliminates soil-borne diseases, requires no tilling, no weeding, no pesticides or herbicides, uses 10% of soil and a fraction of water to grow crops than traditional farming does, and is a zero-waste system.

All of these villages village structures can be either permanent or temporary and, if removed, will have left no impact on the Fly Ranch environment.