



Imagine. Inviting the healing beauty of the desert sky into the privacy of your own sanctuary, while at the same time surrounded by a community of like minds.

This is the inspiration behind **FlyHive**.

FlyHive is a feasible, low-cost modular shelter, sensitive to the environment and harmonious with nature. Not to mention pleasing to the eye. Its unique architecture, founded in biomimicry uses materials that leverage innovative and sustainable technology. Nature models for us the most durable and efficient systems—the beehive, for example, exquisitely illustrates how modular communities bee-come more than the sum of their parts.

FlyHive is also more than the sum of its parts. While each unit functions alone to effectively provide basic shelter needs, it exists within a honeycomb of hexagonal pods creating a collective space. At its very core, FlyHive's design is aimed at fostering community.

Pods can be arranged around a central 'arena,' creating an inner courtyard, a gathering place for large sized groups to engage in classes, performance events, art making, and more. Smaller gathering spaces between pods provides a semi-private hangout space for smaller sized groups to eat, meditate, socialize, and more. Prudent arrangement of the pods will provide shade during the hottest parts of the day, and at the same time reap the benefits of energy collection through rooftop solar panels. As the pod community grows, the opportunity to expand on these ideas and support a more diverse infrastructure of pods is endless, thanks to its modular design.

FlyHive leans heavily on a modular approach, both on a collective and per pod basis. A single FlyPod is a hexagonal prism laid on end. The front is comprised of two wall panels sandwiching a reclaimed wood door and faces into the Hive's inner courtyard. The side walls, floor and ceiling are 12x5.5 foot rectangular panels. The back wall is glass and faces the beautiful natural landscape. Each pod connects to those around it via a universal connection (regardless of pod configuration): align two pod faces and bolt through the predrilled holes along their perimeter. Access holes on the pod's interior allow space to secure fastening nuts by. This design allows The Hive to be built up incrementally and permits a wide variety of hive configurations. Maintenance, complexity, and cleaning of the pods is minimal as well and modular nature means that repairs are as simple as replacing a modular component while it undergoes refurbishment.

Materials

A shelter should be stable, suitable, and sustainable. So should the materials used to construct it. We favor materials that would otherwise be trash, and that sequester carbon. For each panel, steel frames the perimeter. Reformed plastic waste furnishes the outer surface. Grown Mycelium mushroom in-fill provides insulation and a lovely inner surface finish (patterned). Reclaimed wood replaces mycelium as a finish for floor panels. Here's why we love these materials, and think you should too.



Steel. Steel is infinitely recyclable. A robust building material and the benchmark to which all others are compared. Tried, tested, and widely manufactured, the bang for the buck is high. Used frugally and effectively, steel can provide a surprisingly light frame. An effective choice for our pods is the use of Cold-Formed Steel (CF Steel) which has a significantly thinner profile and allows FlyPods to be lighter than a conventional steel structure. Connections of CF Steel are bolted—not welded—eliminating the need for (costly) skilled laborers. Fabrication is cheaper than thicker structural steels, further reducing the overall cost to fabricate and assemble a pod.

Recycled Plastic

The outer surface of the pods must be able to withstand the extreme climate of a desert environment (ideally for an indefinite period of time with little or no maintenance), but most materials that boast the needed staying power are highly manufactured, processed, energy intensive, and detrimental to the environment. *What if we could leverage our past mistakes as a viable resource while helping to reduce a massive existing environmental footprint?* Introduce Precious Plastic. By (unofficially) partnering with a network of individuals working to collect, reshape, and redeem one of our largest environmental scars, FlyPods simultaneously stimulate an environmentally engaged economic community, target a growing global threat, shift the paradigm on what can be done with our “trash,” and boast a beautiful, enduring exterior material. *More than the sum of its pods indeed.*

Mycelium Mushroom

Average temperatures at Fly Ranch range from 20 to 90 degrees Fahrenheit, with peaks well outside that (0-105+). A viable shelter protects from these extremes, preferably with as little energy consumption as possible. Insulation is key. To address this issue, each FlyPod is furnished with six inches of mycelium mushroom insulation. This organic solution thermally and acoustically outperforms most market leading synthetic and organic insulation products. Research shows that mycelium is at least as durable as conventional materials and maintains its insulative properties over its lifetime. Mycelium is its own adhesive, avoiding the use of materials typically containing volatile organic compounds (volatile, as in, actively releasing large numbers of particles into the air). This means better indoor air quality. Did we mention that growing mycelium captures twice its weight in CO₂? That translates to better outdoor air quality.

Reclaimed Wood

Wood is a tried and true building material. Durable, versatile, and naturally beautiful. Deforestation is no joke, however. That’s why reclaimed wood is used for the door and floor panel of each FlyPod. In addition to a positive environmental impact, reclaiming adds a unique look and gives character to the wood.

Glass

The fully windowed glass wall provides ample light (during the daytime) and allows the resident an unobscured view of the natural landscape. We hope it might also inspire a deeper connection and appreciation of nature’s majesty.



Construction

Panels are constructed as inclusive (self-contained) units, allowing for a high degree of flexibility. Spare panels can be pre-assembled for convenience, panels are extremely sturdy, but should a panel become compromised, it can simply be removed, replaced, and repaired without hassle. Panel connections are straightforward: Insert a steel wedge into the gap between framing members and bolt into the wedge. This easily replicable approach facilitates rapid pod assembly.

Energy

In a modern world with omnipresent technology, people expect power to be provided in any living space. To accommodate this need and remain self-sustainable, FlyPods support mounting of Solar panels/sheets. Solar panels mounted on the top units of the hive can easily provide enough energy for the most basic living needs. Solar panels easily last decades, and as a renewable energy source their, positive impact is a lead-in to a post-carbon future. Cleaning panels is easy and infrequent. A leaf blower, quick spray with a garden hose, or good wipedown every 3-6 months is sufficient. Panels are available in a wide variety of colors, and can be chosen to match the endemic palette. Renewable energy never looked so... *natural*.

Funding

A full-scale, functional prototype can come together for nearly \$10k. A fully realized/furnished unit will cost less than double that. The only major element sacrificed in the prototype is the replacement of Glass with Acrylic (unfortunate, we agree). Minor is relocation of the ventilation slats.

Strategy for prototyping will use all the same offsite fabrication techniques as a fully furnished unit. Pre-assembled panels will be transported to Fly Ranch via U-Haul or similar. Once at site, it will be assembled by our team.

Time and cost to build a unit can be streamlined and reduced once the process is in place. Much of the material production can even be done “in-house” after investing in the production hardware. Assembly can be easily completed by unskilled laborers. As the FlyHive collective develops, it will benefit from the capacity to grow at its own pace, with increasing autonomy. Community begets community.



Here's the (real) beauty of the FlyHive concept. People will reside in the privacy of their pods, but a pod's minimalist nature encourages residents to leave the space and spend time in the communal areas. Here they will take full advantage of the Hive collective to build a sense of community, which is – after all – an integral part of the Fly Ranch vision. The truth is, we anticipate our most significant consequence will be providing a space to foster development and accommodate the sustainable growth of community.



We hope to see the FlyHive vision evolve, ADA accessible pods, family pods, shower and bathroom pods with self-sustaining water and waste capture systems, healing spa pods - the modular approach opens the door for infinite possibilities. This can be a place to prove the concept that individuals can come together, build their own housing, and thrive in a larger community; a template that can expand out to real world applications.



ENVIRONMENTAL IMPACT

FlyHive is designed with the environment forefront in mind, netting a positive impact on the environment. Our goal is to stand as a landmark as a holistic system of living in harmony with the planet. The life cycle of The Hive sequesters significantly more carbon than it produces and re-utilizes materials otherwise filling our oceans and landfills (two of our largest threats – physical and gaseous waste). Here's how.

Manufacturing

The heaviest environmental manufacturing consideration for FlyPods lie in physical materials. We've chosen materials that reduce and/or eliminate the environmental detriments generated in manufacturing processes. The more fundamental the process, the more energy efficient it can inherently be.

This is certainly the case for Mycelium, **organically grown** with no hydrocarbons involved and less energy intensive than other insulation materials. It yields little to no toxic waste. Mushrooms aren't quite so picky about their food, so growing Mycelium can utilize commercial and agricultural by-products that otherwise go into landfills. Mycelium also "eats" something else important, consuming twice its weight in CO₂. A win-win manufacturing process.

When organic isn't viable, another strategy is **reusing existing materials**. Consider the intensive energy cost of turning fossil fuels into plastic. Reshaping existing plastic drastically reduces carbon emissions and requires no fossil fuels as input. The Precious Plastic network is a community of individuals working together to transform existing plastic "trash" into a viable resource. The more pods built, the less plastic fills our landfills and oceans.

Reclaimed wood offers the best of both worlds. Both organic and reused. Reclaimed wood reduces use of environmental hazards used in manufacturing new products and is significantly less energy intensive than virgin wood. Wood is a renewable resource, if carefully managed.



Life Duration

In choosing fundamentally durable materials, we envision these materials lasting the life of a Pod with little to no maintenance. The minimalist and modular pod construction encourages repairs and/or refurbishments to broken components versus discarding. A unit's life cycle extends well beyond that of the individual materials and serves as a model for both sustainable and enduring structures.

Solar panels can provide for energy needs for decades. FlyHive is energy self-sustaining and has potential to provide power for other applications. Solar panels have no moving parts, minimizing major repairs due to "wear and tear."

Located in a natural environment, FlyHive will coexist with its surroundings, and blend naturally into the landscape in color. Add to that the minimal ground footprint as a result of the pods' hexagonal shape and stackability.

Post-life Duration

All materials used in the construction of FlyHive are re-usable or organic. Thus, we see little to no net waste at the end of The Hive's life.

Conclusion

We believe FlyHive can surpass the highest standards of excellence, provide for its own sustainable operations, and give back to the earth. Together we can transition to a culture of stewardship. FlyHive can function as the beating heart of this important, blossoming community.