



Becoming Modern

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Abstract

As an architecture student I am constantly looking at nature for design inspirations, and my search often leads me to the structure and design of bees. These tiny creatures are some of the best builder, but their habitat is being destroyed day after day by human development. To combat this, “bee blocks” are often used to provide shelter for the bees, so that they can hibernate and remain undisturbed. However, these blocks lack the ingenuity and complex design ability that bees used to place in their structures. So, in order to regain what they lost, I decided to reimagine the traditional bee block.

Accomplish this goal involved researching the previous man-made and bee-made structures was crucial, along with finding out key elements required to build this structure so that it is safe for bees. After doing this research, I then worked on redesigning it in a way that drew inspiration from original bee structures, without losing its actual functionality. This ended with a sculpture like design, that is fully functional, and relatively easy to build; making it a structure both worthy of the bees presence, easy for the average individual to build, and perfect in helping preserve future bee populations.

Purpose

The purpose of this research is to change the traditional bee block design, in a way that makes the design more sculptural, without taking away the original designs function.

Study System

There are many individual requirements for every single part of the structure. These requirements extend to the materials used, the site chosen, the tunnels and inserts of the structure, and the shelter requirements of the structure.

Structural Requirements

Material requirements are not that hard to procure, as the structure only uses untreated wood, screws, and cardboard inserts, for the protection of these bees. Site options are more limited, as the structures should be near a fairly accessible water and pollen source, away from excessive amounts of animals, and should only be facing east or south. Many of these requirements have to do with allowing the bees to properly function.

The tunnels function as the actual area that the bee would see shelter, so they had more specific requirements to ensure the bees safety. This is why the tunnels are traditionally made into wood with a long drill bit into the untreated wood, then sanded out to ensure easy access for the structures visitors. It is also important to note that having while 3/32” to 3/8” size tunnels will encourage a more diverse population, the thickness of the tunnels themselves needs to adjust accordingly. So the smaller tunnels should only go 5” into the wood and wider should go 6” into the wood, with both having at least a 1” thick backing as well. Another thing to note about the varying tunnel sizes, is that similar sizes should be grouped fairly close together with only 1/2” to 8/4” gaps in between similar tunnels, as similar bees usually like to group near one another.

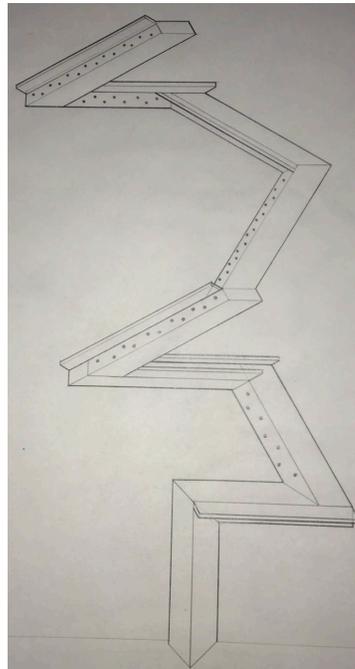
Optional Inserts

Inserts made of rolled wax paper, bamboo, or cardboard are used to help keep the inside of the tunnels smooth, and snag-free. They are also useful if a bee in the insert is infected with pests or diseases as they can quickly be removed from the structure before others are infected. However, the inserts also need to be removed and stored in a cool dry place during the winter seasons, as they don’t have the benefit of direct access to the woods heat source. In order to properly shelter the bees, the structure must: shield them from the elements including rain, snow, and strong winds, has to be at least 4’ off of the ground, and must be facing towards east or south to access the morning light. All seem fairly simple, but are the most important pieces of this project.

Methods and Experimental Design

After completing my research, I then moved onto the design process. This process consisted of me taking the information I had found, and putting it into the structure that I was designing. Making several drafts and adjusting to small details was a common occurrence, as a design isn’t just perfect the first induration and takes time to reach the final design.

Results



My resulting design reflects the intricate many properties of the bees posses. It also reflects several design elements of the structures that they create. Bee structures rely heavily on their angular properties, so I made sure that the different angles used were incorporated. This structure relates to the patterns in which bees fly and the ways that they indicate where food sources are. It is also achieving all of the functionality that is required from all bee structures, in the directions that the structure is facing.



Conclusions

When looking at my final design, I can see the complexity that bee structures traditionally hold, along with the functionality that bee blocks require. This design meets all of my expectations, and I can only hope that making my design more accessible will help others create it in the future. If the structure itself were to be used more by others as a type of “living sculpture”, the survival of bees would increase with every structure placed. Hopefully this would allow the bee population to recover from the damages done by human influence.

Future Directions

If I were continuing to edit and draft new iterations of my design, I would focus on ways to actually get rid of the base of the structure so that it could be placed on a wall or on something that rests naturally four feet off of the ground. I would possibly even research and test if structures like telephone poles or trees to see if they can actually take on the function of the base without harming the bees, structure, or the object used itself. I am proud of the design that I came up with, but the actual base takes up too much of a material, that already has so many requirements.

I would also like to see if there was a way to make the structure without requiring the inserts, as they are a slight inconvenience to the builder, and could be placed in several locations without requiring more frequent supervision.

One thing that would also require more research would be to see how long the structure and wood would be able to withstand the elements. Untreated wood doesn’t last forever, and the last thing I would want is to place structures there without having a solid understanding on how long they could actually help the bees.

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