



ARCH 3691
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Advanced Design and Building Information Modeling February

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| Your Name: | Anil Dipu |
| Name of Project: | New Zealand Solar Decathlon |
| Preference: | The Space has Limited Circulation |
| <p>Circulation is a key element of people moving in and out of the house. Houses that run on appliances are a good way to maintain comfort. Providing room for people to move in and out and having the accessible space is important since comfort is not how we feel. Comfort is defined as what we feel if we are contained in one area.</p> | |
| Use of Passive Solar Strategies | |
| <p>This house practically uses a 6.3 kilowatt solar array with 28 polycrystalline photovoltaic panels installed into the roof in the house. The house converts solar energy to electricity that generates electricity throughout the entire year. This house is useful in terms of storing energy and using it when necessary such as a desert where the temperature rises during the morning and cools during the night.</p> | |
| Use of Sustainable strategies | |
| <p>The First Light house is a net zero homes which uses one third of a typical U.S. house would use. This house can provide a comfort space for tenants if they live in dry humid regions. The strategies it uses to maintain a functional daily living is a high energy efficient pump, solar array, and solar tube collectors. All of these machines provide the capacity to store heat while releasing heat during cold seasons.</p> | |
| Use of Technology | |
| <p>The high energy efficient pump functions as a high recovery system which transfers 4 kilowatts of heat into the space during the winter and pumps cold air during the summer. This is known as an air conditioning system which draws hot air out and draws chill air in during hot summer months. The solar array and the solar tube all gather solar energy from the sun to power the efficient pump.</p> | |



Use of materials

First light is composed of materials such as wood recycled New Zealand Rimu, LVL (Laminated veneer lumber), plywood, and a two inch concrete. The two inch concrete acts as a mass by storing heat during the day and releasing it during the night might like what an adobe works in a desert. Concrete has a high heat storage capacity that it gives off heat during cold climates. It traps heat and releases heat during cold months.

Photovoltaic strategy

The first light consists of 6.3 kilowatt solar array with 28 polycrystalline photovoltaic panels installed into the roof which converts solar energy into electricity. These panels are made of silicon wafers that are connected electrically and packaged into a frame. This system can produce electricity throughout the year. We presume that silicon to be a good conductor of electricity since it can provide energy throughout the year.

What strategy would you copy? What is the greatest strength?

The high energy efficient pump shows that the house can function in different conditions of different climates. What a comfort home should have is its ability to survive at any given climate. Air conditioner is one thing to maintain home comfort while we get its energy from its photovoltaic solar array.

What is the greatest weakness of the entry? What would you avoid?

The first light has three defined spaces which is the Living Room, Study Area, and a Bedroom. The Dining room is located in the middle of the entrance. In the plan of the First Light, the Living should have an entrance to the outside since we feel we can enjoy the scenery outside. The Dining Room entrance proves to be inefficient since most circulation occurs within this region. The Living Room has many circulations where air gets in and out while people also get in and out.

Additional comments?

The First Light is recommended on places in which hot air is abundant during the daytime and cold during the nighttime. This house is limited to arid climates such as a desert since it uses its concrete effectively to deal with these temperatures. The cheap materials use to construct this house is a good way to build a practical house at a given climate.