
Temporary Housing For Displaced People Due To Hurricane

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Background of the Problem

At the southernmost location in the United States lies the island of Key West. At four Miles long and one mile wide, it is at the end of the chain of islands known as the Florida Keys. The island has an estimated 27,000 residents at 11,000 households. Its current highest elevation sits eighteen feet above sea level. In 1912, the island connected to mainland Florida through the creation of an overseas railway, (an extension of the Florida East coast Railway.) The Railway has since been destroyed in a lethal hurricane and was never repaired (1935.) There is one bridge going into Key West at the end of US 1. US 1 is a highway that spans between the Florida Mainland to Key West at nearly 113 miles. This highway connects all of the Florida Keys and is the sole route of entry into the island. The distance from the mainland, as well as the limited access to the island, makes Key West a primary site location for temporary housing in times of limited supply of resources.

Problem Statement

The purpose of this Masters Research Project is to design temporary housing for victims in Key West displaced due to hurricanes. This temporary housing will be a permanent and pre-emptive structure, utilized by the community throughout the year, while always prepared for the unexpected disaster to occur. The main objective of this project is to design a space in which temporary communities may form to rebuild and restore damaged infrastructure in times of limited resources. This project will be a safe haven to those who are at their most vulnerable; without shelter.

FLOAT House

The FLOAT House is located in New Orleans, Louisiana. Morphosis Architects designed the Project in response to the "Make it Right Foundation's" hurricane effort. This project reached completion in 2009. The home is 947 square feet and is single story. The entry is located on the north end of the unit to provide access to the driveway and street. Looking at the project in plan shows a strong correlation in terms of the circulation and access to the programmatic requirements of the unit. A single corridor stretches the length of the unit providing entry points to dining, living, and sanitary spaces.

This efficient method of moving through the unit also allows opportunities for natural lighting on three of the four sides of the corridor while being deemed a "gallery" space. The FLOAT house's primary goals were to be self-sustainable, providing its own water and electric needs during times of disaster similar to that of Hurricane Katrina. This is done through use of the angled roofs that provide both rain-water collection as well as photovoltaic panels. The home also makes use of low flow plumbing, low energy appliances, and geothermal heating and

cooling. The house is structured to resist hurricanes through the use of its raised, modular, pre-fab chassis. This chassis is anchored to piers imbedded into a concrete pad. The idea behind the FLOAT house is to create a home that is better suited to resist flooding, and does so with the usage of guide posts that allow the building to rise vertically in times of flooding. 45 foot deep piles anchor these guide posts.

Post Disaster School

The Bann Huay San Yaw – Post Disaster School is located in Chiang Rai, Thailand. Designed and built in response to an earthquake which displaced over 2,000 students in its destruction of 73 schools, Vin Varavarn Architects designed this school elevated above the ground on metal stilts. The structure reached completion in 2015 and stands elevated on a single level plane raised above the ground. The school is composed of a pentagon shape in section, and an elongated rectangle in plan. This allows the form to consist of multiple bays along its length. Entry is located on the longer length of the building through steel and timber stairs.

This elevated form allows sheltered outdoor activities to take place below. The exterior is clad in fiber cement panels with bamboo to help minimize both cost and weight of the structure. Material selection is due to surrounding context as an example of utilizing surrounding resources. The roof is of metal cladding with resin panel inserts to allow natural lighting within the space. Foyers divide the bays, creating a shared space that acts as a sound buffer and shared storage area.

Guiuan National High school – Typhoon Resistant (concept) In response to Typhoon Haiyan's destruction of the Philippines in 2013, MAT-TER Architecture published its design of a Typhoon Resistant school. The objective of these projects is to raise awareness, as well as possible implementation into the areas affected. This project serves as a prototype for use in other areas prone to natural disaster. The project focused on breaking away from the idea of modular diversity and geometric resilience in order to create a single form structure that operates as a school, community center, and potential shelter in case of disaster or emergency. The structure designed with the use of readily accessible materials in the surrounding context and can be constructed by hand without aid of any complex building systems and heavy machinery.

The design has prominent open spaces within it that function as courtyards while the internal spaces contains the program for schooling. This idea of having separate courtyards interlocked by internal space creates a communal approach of uniting different levels of schooling or "communities." The construction of the school consists of an elevated plain that allows passive cooling and elevation while providing protection from possible flooding. The façade consists of a skin clad with louvers to help control natural lighting, wind, and rain. The roof is shaped in a way that allows rain water collection, helping to make the facility self-sufficient. The structure of the school is built behind the idea of an encompassing roof that is resilient and aerodynamic to wind and water. This roof is supported by the structures of the units below that hold the classrooms and their necessary programs.