

The Broadmoor neighborhood of New Orleans is in need of change. A change that will directly respond to the design failures that came to light during Hurricane Katrina. A change that will respond to the fact that thirty-one percent of the neighborhood's inhabitants are living below the poverty line. A change that will respond to the wasteful construction methods that stem from a time when energy was cheap and plentiful. A change that looks to the future while acknowledging the neighborhood's deep-rooted heritage. FLOW is the change that Broadmoor seeks.

Broadmoor is in a time of transition. Twelve percent of the population is aged 65 or older and many of them are living in substandard housing. At the same time, Broadmoor is experiencing an influx of youth drawn to the nearby universities, employment centers, and affordable housing. The goal of FLOW is twofold: to raise the standard of living for the existing elderly residences while also turning attention to the younger residents moving into the neighborhood; all of which is to be done in a manner that is socially responsible and environmentally sustainable.

The neighborhood as an overall composition is eclectic, with many different revivalist styles representing their respective periods. Placing a contemporary structure into this composition allows us to pinpoint this unique moment of transition in Broadmoor's history. The design of FLOW with its raised living area, front porch, prominent straight run of stairs, and small scale windows simultaneously announces a new design period and recalls the existing styles of the neighborhood. The long accessible ramp and planter system help to ground the raised structure to the site.

Green building strategies do not need to be technically sophisticated, complicated to operate, or expensive to execute, which is especially pertinent for affordable residential structures. New Orleans is an extremely hot and humid climate where the majority of the year is outside the comfort zone. FLOW's design strategies include passive heating and cooling, maximizing natural ventilation, and controlling solar exposure. Creating a light and airy structure is of primary importance in this climate; air and light literally FLOW through the home.

All of the spaces within FLOW are designed around the path of the sun. Both bedrooms feature high slot windows to capture the morning sun from the east. The living areas are light-filled south facing spaces with fenestration that has been carefully designed to fully capture the noon day winter sun while completely blocking the summer sun. On the western façade windows have been eliminated to minimize heat gain from the harsh late afternoon sun. All of the zones along the west façade are designed as buffer spaces for the rest of the house.

An integral component of the FLOW is the courtyard that seeks to fulfill multiple design goals. First, the courtyard nearly doubles the amount of southern exposure that is available for daylighting and ventilation. Because the intended building sites have extremely limited southern exposures, creating as much southern exposure as possible was a primary objective. Secondly, the courtyard separates the building into two thermally broken volumes, which can be conditioned according to the hours during which they are occupied. This approach results in an extremely simple, yet effective zoning scheme. Thirdly, the courtyard allows the building to capture the dominant summer winds from the south and use them for cross ventilation. The courtyard remains a breezy and shady location most of the year, providing refuge from the heat and humidity as well as being a pleasant outdoor living space.

In addition to the passive heating and cooling strategies, FLOW features materials which are environmentally responsible, non-toxic, and durable with a long lifespan.

With twenty-nine percent of Broadmoor inhabitants being physically handicapped, designing an accessible building is also of primary importance. The entire structure was designed around ANSI Standard A117.1, which provided the guidance for the kitchen and bathroom design, as well as clear floor areas around doors and adequate wheelchair maneuvering areas. FLOW features an 84-foot-long ramp at 1:20 providing wheelchair access to the raised main floor. There is also a designated location at the front entrance (proper electrical to be roughed in during construction) for a wheelchair lift. All finish floors are smooth or low pile so wheelchairs may pass over with ease and to prevent tripping hazards for elderly occupants.

The living areas inside FLOW are designed for flexibility and multi-purpose use. Furniture arrangements are easily altered and interior walls are kept to a minimum to encourage air flow and flexibility. Public spaces within FLOW are oriented to the street while private sleeping areas are at the rear of the site, buffered from the street and adjacent lots.

Hurricane Katrina made it clear to the rest of the nation the importance of hurricane resistance for buildings in New Orleans. With the average elevation in Broadmoor one and a half feet above sea level, the area is prone to devastating floods during a hurricane. Because of this, FLOW has the entire first floor raised seven feet above grade. The entire floor

structure and all supporting walls are made of water-resistant materials that are inorganic and will not mold or rot in the case of a flood. The CMU walls supporting the structure are placed in a manner that provides both lateral and vertical load support while contacting the ground in a distributed manner which allows storm surges to flow around the structure without causing catastrophic damage. The house contains many hurricane resistance best practices, including minimal overhangs (to prevent eccentric roof upload forces), an open sun shade on the south façade (to allow wind to flow through without damage), impact resistant front doors, properly engineered hurricane straps and ties connecting the roof to load-bearing supports, properly nailed grid-marked roof sheathing with seams taped with self-adhering bitumen tape to provide a secondary water barrier, and an impact-resistant standing seam high-albedo metal roof.

Education of the building occupants is key to achieving the desired effect of a sustainably designed structure. Prior to occupancy, the owner should be given an orientation, which includes information about the building's operation and maintenance. This is minimal in this structure due to the fact that most of the systems are passive and require little intervention for proper function. The owner should be given instructions for proper cleaning and maintenance of finishes. Before occupancy, all building systems should be balanced and verified by a third party to ensure proper function. An operations manual should be provided to the owner for their reference.

As with most buildings, there is always a tradeoff between cost and quality. The cost estimate has provided for value-engineering alternates, which will allow FLOW to be built within the \$100,000 budget. Unfortunately, these alternates are not recommended as they would seriously negate the sustainable aspects and durability of this project. These alternates would lower the initial cost, but raise the life cycle cost for the owner after occupancy.

Construction costs should be well below average for a structure of this size due to the use of a 4' module, which will minimize construction waste and aid in fabrication. The building is composed of simple volumes with repetitive assemblies, also minimizing cost and construction time. All materials specified were chosen for durability and local availability.

Hurricane Katrina was an epic catastrophe that will continue resonate for many years to come. Veiled within the pain and anguish of this event is an opportunity to rebuild in a manner that is sustainable and takes advantage of the lessons history has taught us.