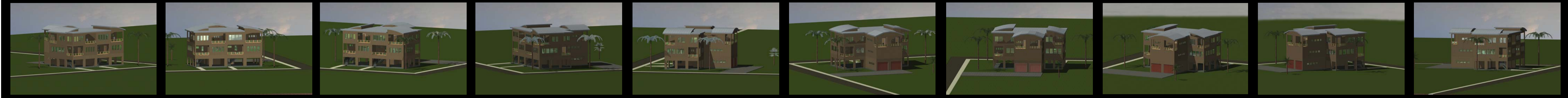


# STORM RESISTANT TILT-UP CONCRETE HOUSING

-SARA BERG-

**Background:**  
In August 2005, Hurricane Katrina caused devastation to parts of the southern United States. Nearly two years later the nation is trying to return the citizens of those states back to normalcy. One of these communities still trying to recover from Katrina is the town of Biloxi, Mississippi.



Axonometric Views of Duplex 1



Perspective of Duplex 1



Perspective Views of Duplexes



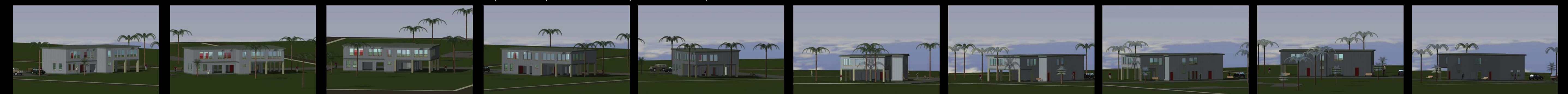
Duplex 1 Exploded Axonometric

**High Mass Building- Tilt-Up Concrete:**  
Many of the buildings that did not stand up in the hurricane were low-mass, wood frame buildings and houses. These types of buildings are good for ventilation in a hot-humid climate like Biloxi; but these buildings are not able to stand up to winds as well as high-mass structure. Tilt-up concrete is an innovative relatively new way to build a strong sturdy residential structure. If a structure like this is assisted by an exhaust fan, the same amount of ventilation can be achieved as a low-mass structure.

**Landscaping:**  
Shade trees with high trunks such as palm trees are good for hot-humid area. These trees provide shading while not blocking wind for ventilation of the high-mass building. These trees also are able to withstand flooding and high winds.



Axonometric Site Plan



Axonometric Views of Community Center

**Building Design:**  
The duplexes are designed with porches all around the structure, there is one shared wall. This design affords a shady place for people to sit, read, or eat during the hot summer days of the south when being in the direct sun would not be desirable.  
The walls of the building are made of Tilt-Up concrete, stucco outside with light color, insulation is located inside of wall.



Duplex 1: Front Elevation

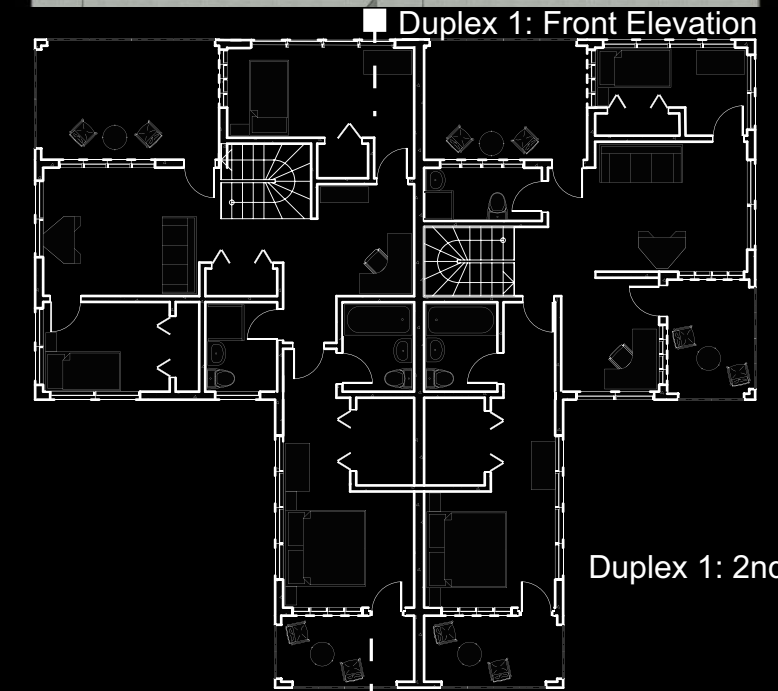


Duplex 2: Back Elevation

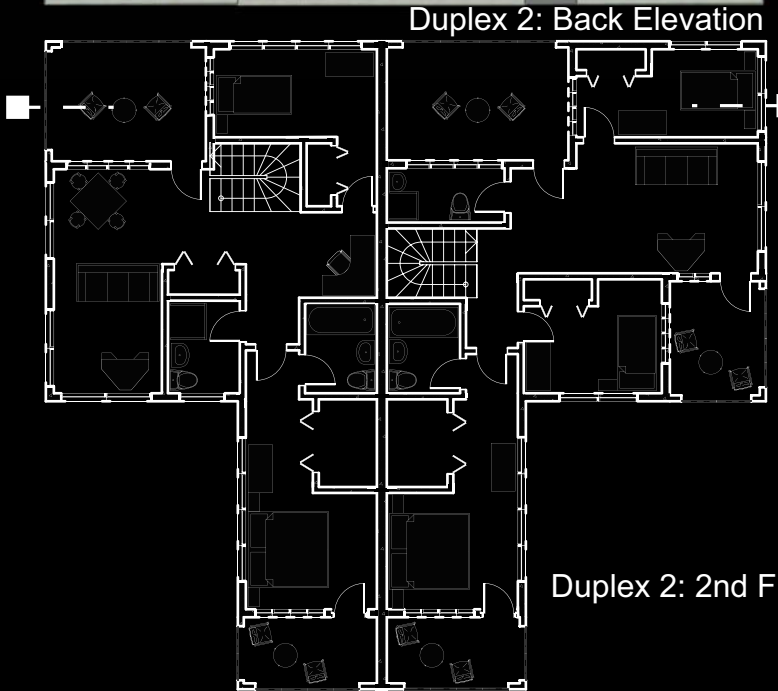
**Stream Lined Roof:**  
The roundness of the roof allows the wind to blow over the structure and there is much less lift than with a traditional gabled roof. Which will reduce damage during a hurricane. The roof is formed from concrete and the insulation of the roof will be located on the inside of the building.



Duplex 1: Left Elevation



Duplex 1: 2nd Floor Plan



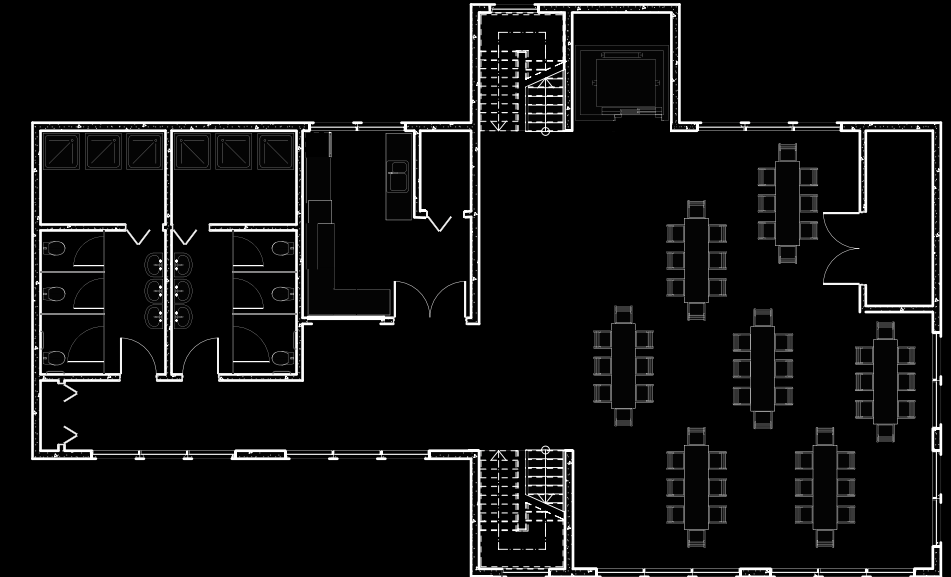
Duplex 2: 2nd Floor Plan



Duplex 2: Right Elevation



Community Center: North Elevation



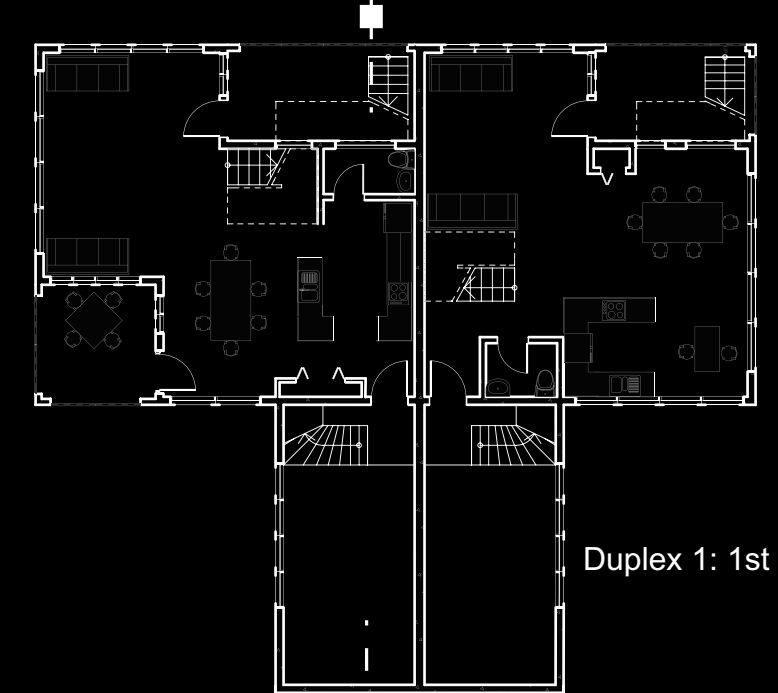
Community Center: 1st Floor Plan



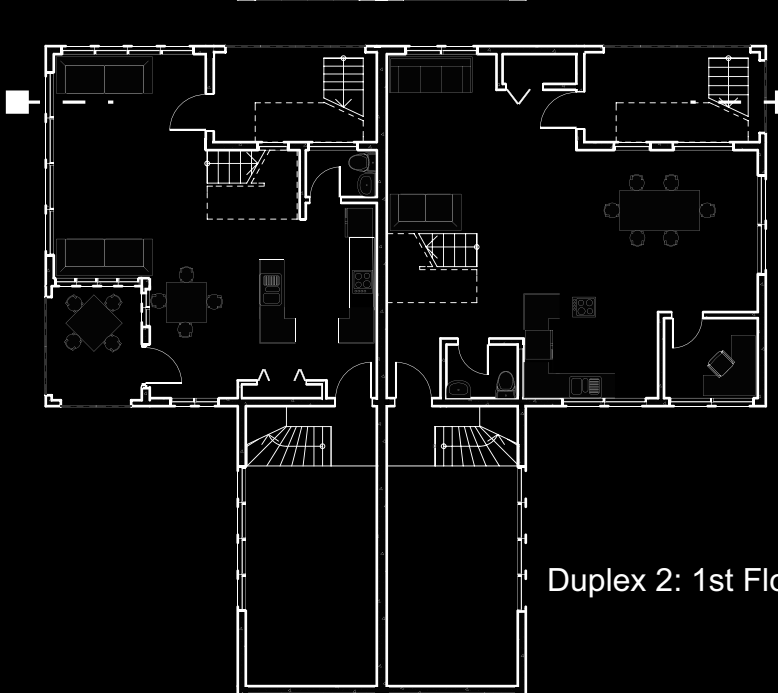
Community Center: East Elevation



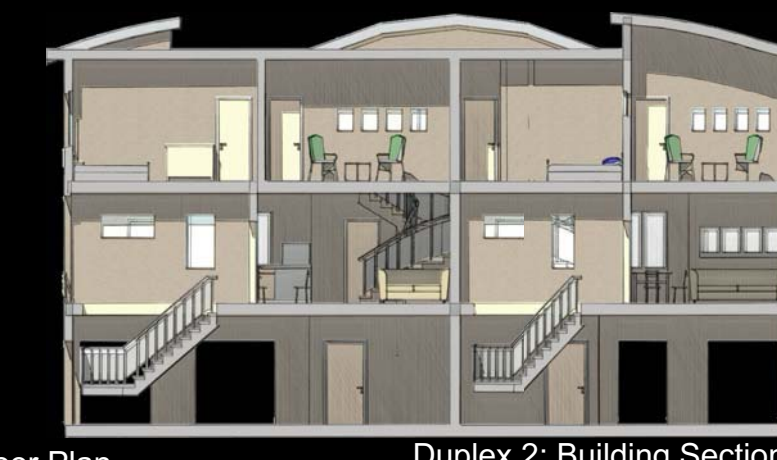
Duplex 1: Building Section



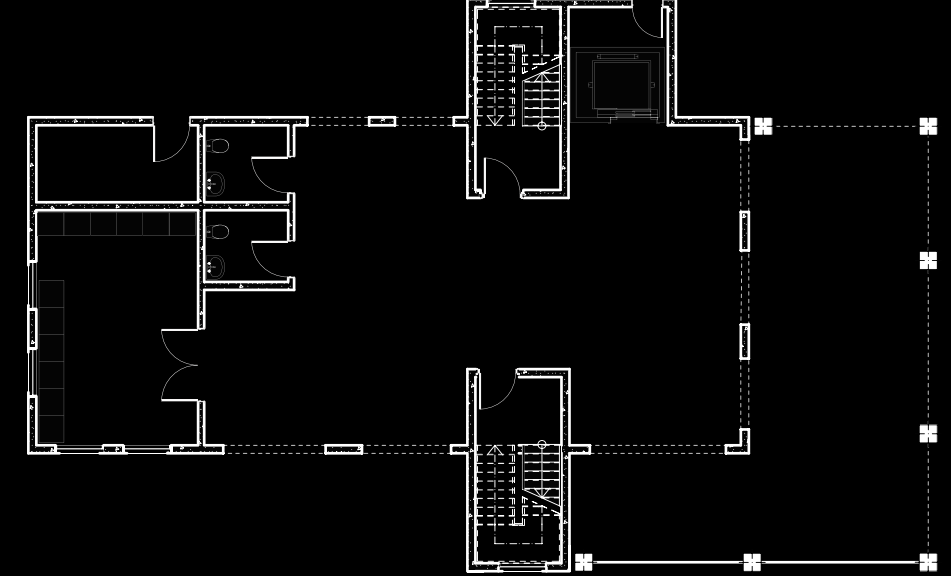
Duplex 1: 1st Floor Plan



Duplex 2: 1st Floor Plan



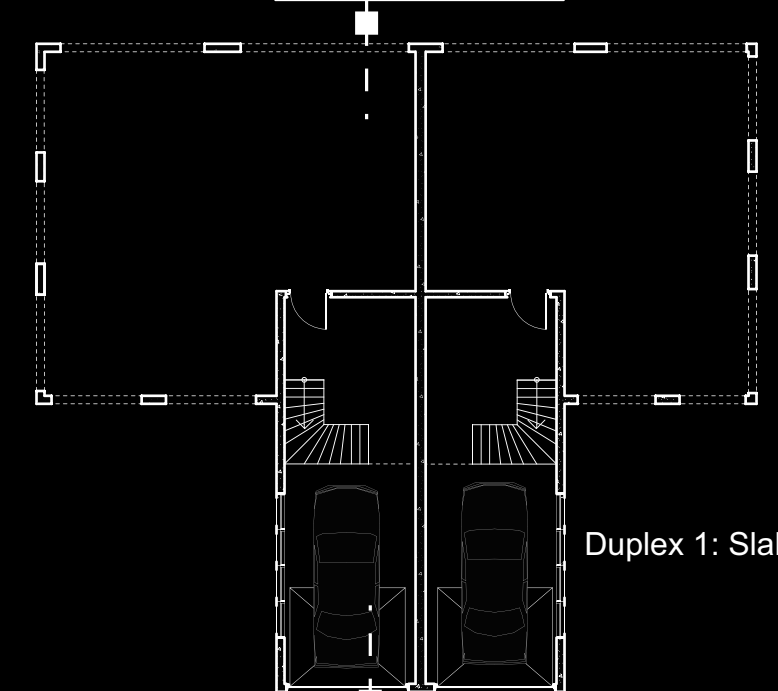
Duplex 2: Building Section



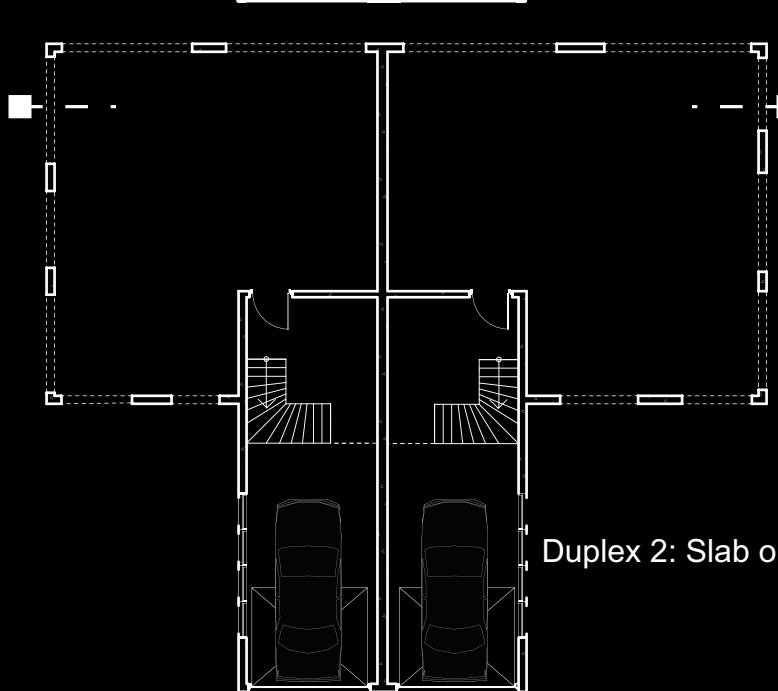
Community Center: Slab on Grade



Community Center: Building Section



Duplex 1: Slab on Grade



Duplex 2: Slab on Grade

**Lifting Building on Stilts:**  
Floods cause loss of life and property damage. These duplexes are built on stilts ten feet above the ground level to avoid flooding.  
Advantages to having a house lifted on stilts:  
- Ventilation is improved  
- All the windows are at least thirteen feet above the ground therefore low lying vegetation will not interfere with the wind flow needed for cross ventilation  
- The area under the building is always shaded and protected from rain and this area can be used as an outside patio



Community Center: South Elevation

**Windows:**  
During a hurricane, windows are usually the weakest points of a building. Windows are set back in the concrete, with strong external opaque pull down shutters that can be closed when a storm is near to protect the building.