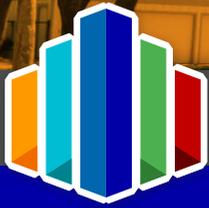


WATERFRONT HOME STANDS UP TO HARVEY



LYNN ENGINEERING

Case Study

OVERVIEW:

TideWater Properties, a custom homebuilder in Rockport, Texas worked with Lynn Engineering to design and build a beautiful waterfront home on the Texas Gulf Coast. This home was the first structure on the street, unobstructed from the water and the first line of defense protecting the other homes down the street.

PRACTICE: Windstorm Engineering, Structural Engineering

SERVICES: Foundation, Framing, WPI-8, TDI, TWIA

EQUIPMENT: Clips, Straps, Hold-Downs, Components, Cladding, Exterior Mechanical Equipment, Wind Borne Debris Protection,

LOCATION: Rockport, Texas

GOALS:

- Design and build a beautiful custom home on the Texas Gulf Coast that can withstand hurricane-level storms
- Complete the project on schedule
- Deliver a beautiful and sturdy custom home within budget restraints

THE CHALLENGE:

This home site is located right on the water in a high-risk build site in Exposure Category D as defined by the ASCE 7 Design Manual – the highest exposure category allowed for construction. On the coast, engineers must design for uplift and lateral forces, as well as for gravity.

Sustained hurricane force winds above 60 mph can often cause significant damage to homes and structures of poor to average construction, including partial wall collapse and roofs being lifted. This is caused by the high velocity and low pressure of the storm as the stagnant air inside of the homes to tries and explode out of the structure.

THE SOLUTION:

Lynn Engineering's design used the most up-to-date and cost-effective Strong-Tie hardware package to meet the load requirements of the project while keeping costs down. The engineering team ensured all connections and lateral resisting systems were properly detailed and clearly shown on construction documents.

During the design phase, it was imperative for Lynn Engineering to accurately classify the load requirements of the structure because of the exposure conditions. While the home was under construction, our inspectors were frequently on-site assisting TideWater Properties to ensure all construction was in compliance with the design drawings and all windows, doors, roof and siding were installed in accordance with TDI Product Evaluation tested assemblies.

THE RESULTS:

Hurricane Harvey made landfall in August 2017 as a Category 4 storm. This home engineered by Lynn Engineering and built by TideWater Properties less than one year earlier was on the front line of eye of the hurricane at landfall and weathered the storm – only suffering minor cosmetic damage while maintaining its structural integrity.

With winds in excess of 130 m.p.h. at the time of arrival, Hurricane Harvey produced storm surges in the area ranging from six to ten feet. Structures all around the home were devastated. During the storm, entire city blocks were destroyed by the hurricane's violent winds and the gymnasium at Rockport-Fulton High School partially collapsed.

Harvey was the most significant tropical rainfall event in United States history, producing more than three feet of rainfall in areas of Southeast Texas over the course of five days. Still yet, this home on a very exposed piece of property remained safe and dry.