# ATTENTION TO DETAIL; GETTING A BIG JOB RIGHT THE FIRST TIME

LYNNENGINEERING

*Case Study*

**OVERVIEW:**
KC Coastal Homes partnered with Lynn Engineering to design and build a massive custom home on a waterfront canal along the Texas Coast. This 5,208 sq. ft. two-story home on slab foundation features eight bedrooms and seven bathrooms, as well as a 465 sq. ft. garage, and nearly 1,000 sq. ft. of outdoor patio space. The home required very complex engineering plans to achieve the features the homeowner desired while meeting specific requirements for TDI and TWIA windstorm engineering.

**PRACTICE:** Windstorm Engineering, Structural Engineering

**SERVICES:** Design, Inspections

**EQUIPMENT:** Straps, Hold-Downs, Components, Cladding, Exterior Mechanical Equipment, Wind Borne Debris Protection, Trusses, Beams, Stud Connectors

**LOCATION:** Aransas Pass, Texas

**GOALS:**
- Beautiful and massive waterfront home
- Custom features that wow
- Ensure that engineering plans are followed in detail

**THE CHALLENGE:**
This homesite 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.

The home is very large, and complex. The design features second-floor walls that are not sitting just above, and thus not supported by, first-floor walls.

There are multiple roof systems that require special attention to framing.

**THE SOLUTION:**
This very large home required intricate details in the foundation, framing and roofing plans. In the design it was important to specify where the second floor is supported by the first floor for efficient framing, windstorm and foundation design as the second-floor walls are not directly sitting on first-floor walls in some areas. To support the loads, the home required specially designed beams and roof trusses, as well as uncharacteristically large joist hangers to hold the beams. Additionally, the design of the home required interior shear walls, rarely used in a single-family residence, to transfer the lateral load from the roofing system to the foundation.

Special attention to detail was required and additional inspections to ensure that the home's unique features are built to last. Specific areas needing special attention include framing in large, open areas; straps connecting first- and second-floor studs; and roof framing. Lynn Engineering's inspectors and project engineers made several visits to the homesite during construction to ensure that these items were installed per the engineering plan and to answer questions for the contractors who were performing work outside of the daily routine scope of homebuilding.

**THE RESULTS:**
As a result of creative engineering and problem-solving, as well as special attention to detail in both the design and inspection phases, this massive custom home enjoys a waterfront view on the Texas Coast. The builder and homeowner both have peace of mind knowing that every detail has been checked and double-checked to ensure the structural integrity of the home and they know that their unique home is built to last.

**HIGHLIGHTS:**
- Specially designed beams and roof trusses
- Interior shear walls to transfer lateral load
- Site visits by engineer and additional inspections