Why Have Your Home Engineered?

1. Custom Home Performance

The prescriptive requirements of the North Carolina Residential Code are designed to produce a minimum standard for performance. A custom home should perform better than the minimum standards, especially in the living areas. An engineer will make decisions for how to frame your home balancing structure cost and the performance you should expect from the home. Code minimum prescriptive requirements will not prevent shaky floor systems or cosmetic damage due to highly loaded areas. An engineer will look at how the different systems relate to one another, ensure that proper load transfer is achieved, and choose framing direction and size based on needs and cost.

2. High Wind Zone

Most of South Eastern North Carolina is considered a high wind zone. The North Carolina Residential Code has a chapter devoted to high wind zone construction (Ch. 44), but the prescriptive requirements listed in that chapter do not cover the unique conditions that occur in custom homes.

3. Flood and Coastal Hazard Area

There are a variety of agencies and documents involved in determining the construction requirements in flood and coastal hazard areas. The National Flood Insurance Program, FEMA, local building Codes, and other code agencies all have recommendations for how to build in these areas, but these organizations are not always in agreement. The North Carolina Residential Code has a chapter devoted to coastal hazard areas (Ch. 45), but the prescriptive requirements listed in that chapter do not cover all of the requirements of NFIP or FEMA. Many coastal areas and V-zone flood areas require the design of an engineer to issue a building permit. The engineer's knowledge of the requirements of the different agencies and the referenced documents can be very useful in determining how to build your home and in communicating with the various officials in charge of flood plane management.

4. Overall Cost

The cost to have a home engineered is often seen as an unnecessary expense, but in fact, the engineering often pays for itself. In some instances the cost savings come in the form of better framing decisions than what was made on the original design plans. Thousands of dollars can be saved by proceeding with local engineering instead of relying on Code, contractor experience, non-local engineering, or the "engineering" design of a non-engineer. Other savings are to be had during construction. An engineered home will have fewer problems during construction, so construction delays are avoided or minimized, extra inspection fees from the Code Enforcement Office are avoided, and unplanned framing expenses are avoided.

5. "My home was engineered by the lumber or truss supplier."

Lumber and truss companies typically only provide engineering for components of the home, such as the floor trusses, roof trusses, I-joist, or miscellaneous beams. This design does not typically consider the structure as a whole or how systems work together. As an example, the main-wind-force-resisting system of the house is partly comprised of the floor diaphragm, roof diaphragm, shear walls, foundation elements, and connections. The Code has minimum nailing patterns and minimum standard details that help create the proper systems and load transfers, but the Code does not and cannot realistically cover all conceivable conditions. When your home is engineered, the specific needs for your structure are considered. The cheapest way to orient trusses or joists is not always the most cost effective way to orient the trusses or joists when considering the whole structure. An engineer will orient framing in the manner best suited for the home as a whole, whereas the lumber or truss supplier may only look at the framing in the traditional orientation. There is also a tendency to increase span and spacing using engineered products, which can actually lead to worse conditions than if conventional framing was used. Engineers will work with the lumber or truss suppliers to create systems that best utilize the materials at hand while providing the homeowner the level of performance they desire.

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