



## **Approved Alternate Method for Anchor Bolt Repair/Replacement 5/24/2021**

Use of Simpson Titen HD Anchors when anchor rods are missed or damaged.

The 2018 NC Residential Code Table R4504.2.1.2 calls for the use of 5/8-inch anchor rods every 96 inches or 1/2-inch rods every 72 inches.

A builder has requested the use of Simpson Titen HD bolts to replace anchor that were present at the foundation inspection but have been damaged or spacing requirements have not allowed them to stay installed after concrete is poured.

After review by Michael Slate, Jeff McIntosh, John Hyman, and Kevin Somersett, it was determined that a single Titen HD bolt did not meet the tension strength of a single 5/8 threaded rod.

Due to the variety of available products, we selected a standard Simpson threaded rod and retrieved the tension strength from their website. ATR5/8 was rated at 6,675 lbs. tension strength. We then compared this to the pullout resistance in cracked concrete for a Titen 5/8 bolt. The Titen was rated at 5,570 lbs. at 5-1/2-inch embedment and 3,040 lbs. at 4-inch embedment. Neither met the rating of a single rod fully embedded in concrete and tied to the foundation, but 2 would exceed the rods rating.

It was agreed by the Evaluation Panel that 2 bolts could replace 1 rod but would be limited to 10% of the required anchor rods. The bolts would be then spaced apart to distribute their upfit rating more evenly and not damage the concrete foundation by proximity.

Any amount more than 10% of the homes required anchor rods will require the approval of a registered design professional (Architect or Engineer) licensed in the state of NC.

### **Approved based on the following parameters:**

1. Simpson Titen HD 5/8" Anchors (only)
2. 5 1/2" Embedment with new anchors
3. 2:1 replacement ration (2 new to 1 being replaced)
4. 30" maximum spacing for new anchors

A handwritten signature in black ink, appearing to read "Michael Slate", is written over a horizontal line.

**Michael Slate**  
Director, Code Administration  
Brunswick County, N.C.