

CALIFORNIA COUNCIL OF TESTING & INSPECTION AGENCIES

FAQ_{10.034}

MINIMUM BOLT - NUT ENGAGEMENT

Q I'm working on a project where the bolts were mis-ordered short. When installed according to the plans and specs, the end of the bolt is flush with the face of the nut. How much of a bolt must project beyond the nut when properly installed?

Submitted by Inspector in San Francisco

Response Submitted by Terry Eglund

A Though a common rule-of-thumb is "three threads past the nut", it is just that – a rule-of-thumb, with no basis in fact. In order to arrive at the right answer, we need to follow the reference document chain.

If we start with the 2012 IBC, section 1705.2.1 states, "...Special inspection for structural steel shall be in accordance with quality assurance inspection requirements of AISC 360." which is a very broad statement. Chapter 35 is a little more specific by designating AISC 360-10 "Specification for Structural Steel Buildings".

Section N5 (6) uses the provisions of RCSC *Specification for Structural Joints Using High Strength Bolts*, to confirm materials, procedures and workmanship. Thus, we have arrived at the correct specifying document, *Specification for Structural Joints Using High Strength Bolts*, hereafter referred to as the RCSC 2009.

Section 2.3.2 of the RCSC 2009 states, "The bolt length used shall be such that the end of the bolt extend beyond or is at least flush with the outer face of the nut when properly installed." So while the old rule-of-thumb won't hurt, the short bolts will work just fine.

Terry Eglund is a principal at Testing Engineers Inc., and a registered engineer in California. He can be reached at terry@testing-engineers.com

Reference Documents

2009 RCSC "*Specification for Structural Joints Using High Strength Bolts*"

<http://www.boltcouncil.org/files/2009RCSCSpecification.pdf>

AISC 360-10 "*Specification for Structural Steel Buildings*"

<http://www.aisc.org/WorkArea/showcontent.aspx?id=26516>

Published December 2008/Updated October 2012

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