

**KANSAS DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISION TO THE  
STANDARD SPECIFICATIONS, EDITION 2015**

Delete SECTION 1615 and replace with the following:

**SECTION 1615**

**ANCHOR BOLTS FOR STRUCTURAL USES**

**1615.1 DESCRIPTION**

This specification governs the threaded and non-threaded fastener components utilized for anchoring structural components to a concrete foundation or base.

**1615.2 REQUIREMENTS**

**a. General.** Fastener components and coatings governed through this specification must comply with subsection 1615.2b unless specified otherwise in the Contract Documents.

**b. Anchor Bolts.**

(1) Provide externally threaded steel anchor bolts (including permitted grades and styles of nuts, and hardened washers) that comply with AASHTO M 314. The bolt strength grade and size will be shown in the Contract Documents. Provide rolled threads for all applications except for bridge bearing application where cut threads may be utilized as an option. Provide non-threaded anchor bolts that comply with the applicable sections of M 314.

(2) If no coating process is specified in the Contract Documents, furnish either a hot-dip coating or a mechanically deposited coating satisfying the requirements of AASHTO M 314.

Note: Steel-to-steel thread engagement is reduced between bolt and nut when the nut is tapped oversize. Nuts zinc-coated then tapped oversize will have a lower tensile capacity than nuts not tapped oversize. To conform to the nut proof load requirements of ASTM A 563, Table 3, provide bolt and nut threads that fully conform to the requirements, including all referenced standards, of AASHTO M 314.

(3) Swedged anchor bolts shall conform to the above requirements. In addition, provide deformations for swedged anchor bolts that comply with the following requirements.

- Depth - no more than 1/8 inches.
- Radius – not less than 1/2 inches.
- No more than one deformation occurring in any plane perpendicular to the shaft of the bolt.
- At least one deformation within each 1-inch length of bolt.
- Adjacent deformations shall be out of phase by a minimum of 90 degrees.

**c. Compressible-Washer Type Direct Tension Indicators (DTI's) – when required**

(1) When Grade 55 anchor bolts are specified in the contract documents, provide DTI's that conform to the requirements of ASTM F 2437. Provide DTI's having a nominal diameter and Grade equivalent to the anchor bolt grade specified.

(2) When 2-3/4 inch diameter Grade 55 anchor bolts are specified in the contract documents, provide DTI's conforming to the previous paragraph but with the following exceptions:

(a) Nominal diameter = 2-3/4 inches.

(b) Inside and outside diameters, thickness, and protrusion bearing diameter shall be suitable for the size of bolt, nut and washer to be used.

(c) The acceptable range of mean compression load (lbs) shall be based on the following:

Minimum value = 0.95 \* tensile stress area (sq. in.) \* 0.6 \* 55,000 psi

Maximum value = 1.05 \* tensile stress area (sq. in.) \* 0.6 \* 55,000 psi

For a 2-3/4 inch diameter anchor bolt with UNC threads, the tensile stress area = 4.93 sq. in.

See **TABLE 1615-1** for calculated values.

<b>TABLE 1615-1: MEAN COMPRESSION LOAD RANGE (Pounds)</b>	
<b>DTI Nominal Diameter</b>	<b>Grade 55</b>

### 1615.3 TEST METHODS

Conduct all tests required by the applicable AASHTO, ASTM, ASME, ANSI, or other component or material specifications of **subsections 1615.2b and c**. Measure the coating thickness by any one of the methods specified in ASTM B 633 and by eddy current methods, ASTM B 244, provided that appropriate calibration procedures and standards have been applied. The magnetic induction and eddy current methods are nondestructive in nature and are preferred. Destructive techniques, i.e., coating removal, may be utilized as referee methods.

### 1615.4 PREQUALIFICATION

Not applicable.

### 1615.5 BASIS OF ACCEPTANCE

Submit for approval a Type A certification (certified mill test report), as specified in **DIVISION 2600**, for all fastener components. For DTI's the certification must show conformance with all dimensional, and chemical and physical requirements of ASTM F 2437, paragraph 15.2.

Receipt of a load-gap curve to aid in installation. Include the number of "refusals" corresponding to the mean compression load range shown in ASTM F 2437, Table 1 or **TABLE 1615-1**, dependent on the DTI's nominal diameter.

In the event the certification requirements described in the previous paragraph cannot be complied with, submit samples representative of the lot(s) and heat(s) of the components and materials provided to the Engineer of Tests for testing. These samples must comply with **subsection 1615.2**, including the proof load requirements of ASTM A 563.

Inspection by field personnel of all fastener components for compliance with corrosion protection and dimensional requirements.

The final disposition of fastener components will be completed at the final destination as the result of inspection for the quality of workmanship, the delivery condition.

06-4-18 C&M (CFN)  
Nov-18 Letting