

SECTION 03150 - ANCHOR BOLTS AND EMBEDDED ITEMS

1.0 SCOPE OF WORK

The work covered by this Section consists of furnishing all equipment, materials, and labor, and performing all operations required to fabricate and furnish anchor bolts and embedded items.

2.0 APPLICABLE SPECIFICATIONS

2.1 The Contractor shall follow the practices and standards described in the latest editions of the following specifications which are made a part of this Section.

2.1.1 American Institute of Steel Construction (AISC)

Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design

Code of Standard Practice for Steel Buildings and Bridges

2.1.2 American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME)

B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)

B18.2.2 Square and Hex Nuts (Inch Series)

B18.22.1 Plain Washers

2.1.3 American National Standards Institute/American Welding Society (ANSI/AWS)

A5.1 Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding

D1.1 Structural Welding Code - Steel

2.1.4 American Society for Testing and Materials (ASTM)

A36 Standard Specification for Structural Steel

A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

- A143 Standard Recommended Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement
- A193 Standard Specification for Alloy Steel and Stainless Steel Bolting Materials for High-Temperature Service
- A194 Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure and High-Temperature Service
- A307 Standard Specification for Carbon steel Bolts and Studs, 60,000 psi Tensile Strength
- A563 Standard Specification for Carbon and Alloy Steel Nuts

3.0 REQUIREMENTS

3.1 General

This Section shall govern if there is conflict with referenced specifications. Any conflict shall be immediately brought to the attention of the Owner.

- 3.1.1 Anchor bolt and embedded item fabrication, whether performed in the shop shall conform to the requirements of this Section and referenced Specification Sections.
- 3.1.2 Machine bolts and fabricated anchor bolts are covered by this Section.
- 3.1.3 Materials for anchor bolts and embedded items shall be new. Certified copies of mill test reports covering the anchor bolt material to be used shall be furnished upon request.
- 3.1.4 Embedded items covered by this Section shall include, but not be limited to, the following items:
 - 3.1.4.1 Embedded angles for curbs, floor plate, and floor grating.
 - 3.1.4.2 Miscellaneous embedded plates, angles, channels, and other shapes
 - 3.1.4.3 Embedded U-bolts and eyebolts
 - 3.1.4.4 Embedded ladder rungs
 - 3.1.4.5 Embedded pipe sleeves or shaped plates

3.2 Materials

3.2.1 Anchor Bolts

Anchor bolt material shall conform to the requirements of ASTM A307, ASTM A36, or ASTM A193, Grade B7. Material for anchor bolts shall be as indicated on the drawings.

3.2.2 Nuts

3.2.2.1 Nuts for A36 anchor bolts shall be in accordance with ANSI/ASME B18.2.2, heavy hex, and shall conform to ASTM A563.

3.2.2.2 Nuts for A193 anchor bolts shall be heavy series, hex, and shall conform to ASTM A194, Grade 2H.

3.2.2.3 Nuts for machine bolts shall be hex nuts, conforming to ASTM A307.

3.2.3 Washers

3.2.3.1 Washers for A36 anchor bolts and A307 machine bolts shall be plain washers conforming to ANSI/ASME B18.22.1, Paragraph 1.4.2.

3.2.3.2 Washers for A193 anchor bolts shall be hardened washers conforming to ANSI/ASME B18.22.1.

3.2.4 Anchor Plates

Anchor plate material shall conform to ASTM A36 for A36, A307 and A193 bolts.

3.2.5 Anchor Bolt Sleeves

Where shown and called for on the design drawings, anchor bolt sleeves shall be Wilson anchor bolt sleeves as manufactured by Wilson Anchor Sleeve Incorporated, Stamford, Connecticut, or an equal acceptable to the Engineer. Sleeves shall be cylindrical type high density polyethylene construction with 3/32 in. minimum wall thickness. Sleeve diameter and length shall be as called for on the design drawings.

3.2.6 Embedded Plates, Shapes, and Bars

Plates, shapes, and bars for embedded steel items shall conform to the requirements of ASTM A36, unless otherwise shown on the drawings

3.2.7 Embedded Pipe Sleeves and Shaped Plates.

Pipe sleeves shall be standard weight pipe and shall conform to the requirements of ASTM A53, Grade B. Shaped Plates shall be ASTM A36.

3.2.8 Embedded Steel Anchors

Anchors for embedded steel items shall conform to the requirements of ASTM A36.

3.2.9 Welding Electrodes

Welding electrodes shall conform to ANSI/AWS A5.1 with a minimum electrode tensile strength of 70 ksi.

3.2.10 Specialty items

Specialty embedded items shall be furnished as indicated on the drawings.

3.3 Fabrication

3.3.1 Anchor bolts and embedded steel shall be fabricated in accordance with the details shown on the drawings.

3.3.2 Threads for anchor bolts shall be coarse thread series (UNC) except for bolts that are to be post-tensioned. All post-tensioned bolts shall be eight-thread series.

3.3.3 Welding shall conform to ANSI/AWS D1.1 using Class E70XX electrodes conforming to ANSI/AWS A5.1. Do not weld anchor plate to A193 bolts. Tack welds to prevent rotation are acceptable.

3.3.4 Hooks for anchor bolts shall be bent cold.

3.3.5 Fabrication shall be accomplished in a workmanlike manner. Poor workmanship even though structurally sound shall be cause for rejection on items where appearance is a justifiable consideration.

3.4 Coatings

3.4.1 When galvanizing is specified, anchor bolts, plates, nuts, washers and embedded items shall be hot-dip galvanized in accordance with the requirements indicated on the drawings and ASTM A123 and ASTM A143. However, hot-dip galvanizing of high-strength bolts (A193) will be prohibited. Use of electrical or mechanical zinc depositing will be acceptable.

3.4.2 When coating other than galvanizing is specified, anchor bolts, plates, nuts, washers and embedded items shall be coated in accordance with the drawings and the project coating specification.