

Literature Review
Corrosion Protection
Miscellaneous Steel in Masonry

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1997 UBC

The 1997 UBC states in Chapter 14, *Exterior Wall Coverings* that “Anchors, supports and ties shall be noncombustible and corrosion resistant.” (Section 1403.3, *Materials*). Further, in the same section, it states:

When the terms “corrosion resistant” or “noncorrosive” are used in this chapter, they shall mean having a corrosion resistance equal to or greater than a hot-dipped galvanized coating of 1.5 ounces of zinc per square foot (458 g/m^2) of surface area. When an element is required to be corrosion resistant or noncorrosive, all of its parts, such as screws, nails, wire, dowels, bolts, nuts, washers, shims, anchors, ties and attachments, shall be corrosion resistant.

UBC Chapter 22, *Steel*, does not have any discussion of protection of structural steel.

1999 MSJC Specification

Section 2.4 F *Coatings for corrosion protection*, gives requirements for joint reinforcing, ties and anchors that appear to be a mix of the 1997 UBC and 2000 IBC requirements. They reference the 1.5 and 0.1 ounce zinc per square foot requirements in conjunction with the 75 percent humidity threshold. It appears that lintels are not covered under these provisions.

2000 IBC

The clear language of the 1997 UBC unfortunately disappeared from Chapter 14 in the 2000 IBC, but appears to have moved to Chapter 21, Section 2103, *Masonry Construction Materials*. Specifically, Section 2103.11.6 *Corrosion protection*, states:

Metal accessories for use in exterior wall construction or interior walls exposed to a mean relative humidity exceeding 75 percent shall be hot-dipped galvanized after fabrication with a minimum coating of 1.5 ounces of zinc per square foot (458 g/m^2) in accordance with ASTM A 153. Metal accessories for use in interior wall construction shall be mill galvanized with a

minimum coating of 0.1 ounces per square foot (31 g/m²) in accordance with ASTM A 641 for wire anchors and ties; and Class G-60 for sheet metal anchors and ties.

Metal “accessories” is not defined.

IBC Chapter 22, *Steel*, states in Section 2203.2 *Protection* that: “Painting of structural steel shall comply with the requirements contained in either the AISC-LRFD or AISC-ASD or AISC-HSS.”

2002 MSJC Specification

Section 2.4 F *Coatings for corrosion protection* removes the 75 percent humidity language and now differentiates between mill and hot-dipped galvanizing.

2003

The 2003 IBC modifies the previous version of the section (now Section 2107.11.7) as follows:

Corrosion protection for carbon steel accessories used in exterior wall construction or interior walls exposed to a mean relative humidity exceeding 75 percent shall comply with either Section 2103.11.7.1 or 2103.11.7.2. Corrosion protection for carbon steel accessories used in interior walls exposed to a mean relative humidity equal to or less than 75 percent shall comply with either 2103.11.7.1, 2103.11.7.2 or 2103.11.7.3.

Section 2103.11.7.1 deals with hot-dipped galvanizing, Section 2103.11.7.2 with epoxy coatings, and Section 2103.11.7.3 with mill galvanizing. However, Section 2103.11.7.3 gives an out under paragraph 3. It states: “For anchor bolts, steel plates or bars not exposed to the earth, weather or a mean relative humidity exceeding 75 percent, a coating is not required.”

Carbon steel “accessories” is not defined.

IBC Chapter 22, *Steel*, states in Section 2203.2 *Protection* that: “Painting of structural steel shall comply with the requirements contained in either the *AISC Load and Resistance Factor Design Specification for Structural Steel Buildings* (AISC-LRFD), *ASIC Specification for Structural Steel Buildings* (AISC 335) or *AISC Specification for the Design of Steel Hollow Structural Sections* (AISC-HSS).”

2005 MSJC

Section 2.4 F *Coatings for corrosion protection* replicates that of the 2002 MSJC except the epoxy coating requirement for joint reinforcing is relaxed in 2005 from ASTM A 884 Class B (18 mils) to Class A (7 mils).

2006

The 2006 IBC essentially repeats the language in the 2003 IBC in what is now Section 2103.13.7. The only change is that the subsections referenced are reordered 2103.13.7.1 (mill galvanized), 2103.13.7.2 (hot-dipped galvanized) and 2103.13.7.3 (epoxy coatings)

IBC Chapter 22, *Steel* states, in Section 2203.2 *Protection*, that: “Painting of structural steel shall comply with the requirements contained in AISC 360.”