

## SECTION 05050CP METALS – BASIC MATERIALS AND METHODS

### PART 1 - GENERAL

#### 1.1 SCOPE

- A. This section applies to all miscellaneous and ornamental metals that receive exterior exposure, such as handrails, guardrails, bollards, exterior metal stairs, gratings, ladders, trellises, and exposed structural elements such as shelf angles, etc.

#### 1.2 CORROSION RESISTANCE

- A. All metals with exterior exposure must be hot dip galvanized, stainless steel, aluminum, brass, or other corrosion-resistant materials. Miscellaneous electrical items such as conduits and brackets must also be corrosion-resistant or plastic, if permitted by code. Zinc-electroplated metal is not acceptable. Painted steel is not acceptable.
- B. Steel elements exposed the interior of masonry wall cavities must also be made of corrosion-resistant or galvanized metals, or shielded from the wall cavity with self-adhered waterproofing membrane.
- C. Metal items embedded in masonry, stone, or concrete may only be brass or stainless steel. Aluminum, galvanized steel, or coated steel is not acceptable for embedment. All fasteners used in stone, masonry, or concrete must also be stainless steel or, in the case of expansion anchors, brass. Do not cast pipe sleeves into exterior concrete unless they are stainless steel. Otherwise, use a galvanized base plate with stainless steel fasteners extending into the concrete.
- D. For high-humidity environments where condensation is expected, such as enclosed swimming pools where chloride ion is present, follow more stringent guidelines appropriate for highly corrosive environments. Ordinary 304 stainless can be corroded by chloride ion in chemically pure condensate water. The guidelines of this section do not apply to high-humidity or corrosive environments.
- E. Galvanized metal intended for painting must be prepared properly to receive paint; see related Painting sections.

#### 1.3 OTHER CONSIDERATIONS

- A. Exposed Fasteners – Avoid exposed fasteners in locations accessible to the public. Where it is necessary to use fasteners, use tamper-proof type.

- B. Thermal Movement – Avoid long, continuous runs of handrail, angles, or other items subject to thermal cycling. Divide long runs into a series of shorter sections, each no longer than 40-50 feet.
- C. Structural Attachment - Attach metal items directly to supporting structural elements such as concrete slabs, structural steel, footings, or brackets extending to the building structure. Do not make primary attachments to brick or stone veneer, metal studs, curtainwall, or other secondary elements unless calculations show that these elements are capable of withstanding the load and transmitting it to primary structural elements. Do not attach handrails through gypsum or other friable material; provide rigid steel collars against which to tighten the fasteners.
- D. Cap Watertight – Use watertight welds to fully seal the ends of all hollow objects, such as tubes and pipes, so that they cannot collect water or condensation, or become a conduit for water or condensation. If the geometry of the piece does not permit fully sealing the ends, use a different geometry that does not create internal spaces where water can collect, that cannot be effectively hot-dip galvanized and painted.
- E. Grout all baseplates solid after installation. Pack the grout tight to ensure that no voids remain. Do not leave plastic or metal shims exposed in the finished work. Use non-metallic, non-shrink grout.

## PART 2 - PRODUCTS

### 2.1 GALVANIZED STEEL

- A. Galvanizing - ASTM A123. Galvanize all assemblies *after* fabrication to the greatest extent practical. Avoid the need to make field welds, which destroy the zinc coating. Instead, used bolts or concealed fasteners to join sections in the field. Where field welding is unavoidable, grind all welds smooth and touch up with zinc-rich paint per ASTM A 780
- B. Painted Galvanizing – Apply epoxy shop primer within 12 hours of galvanizing, min. 3 mils thickness, “Primergalv” by Duncan Galvanizing or equal.
- C. Stainless Steel – ASTM A 276, Type 304 or higher (i.e. Type 316).
- D. Aluminum Extrusions, ASTM B221, alloy 6063-T6

## PART 3 – EXECUTION – not used

END OF SECTION

