

The optimum use of Allied's Mechanical Galvanized Steel Tubing begins with design and installation considerations that take advantage of the superior corrosion protection provided by the triple layer Flo-Coat® process.

For in-ground posts, trusses, welded components, and general construction, the following suggestions may greatly improve the product life and cosmetic attractiveness of the tubing.

#### Concrete Anchored

Based on studies about cement usage, the recommended grouts are Portland cement-based systems. The problem grouts are primarily gypsum-based systems (which may contain a small amount of Portland cement). The Portland cement systems provide good protection for embedded steel due to their high alkalinity (pH). The problem grouts did in some cases have a high pH, due to the presence of some Portland cement; however, the lower amount of Portland cement provides limited protection. This system can completely carbonate sooner, lowering the pH and reducing the corrosion protection. Gypsum-based grouts also pose additional problems because they are slightly soluble in water and can soften when exposed to moisture. This allows water and oxygen to more readily penetrate to the embedded metal. The gypsum-based grouts contain ionic components which can promote corrosion; and if they contain or contact Portland cement and water, they can produce ettringite, an expansive reaction that can lead to cracking, warping or spalling.

The concrete column anchoring the tube should also extend above soil level and pitched on top so water drains away from the column.

#### Ground Anchored

Ground anchored or in-ground posts should be sealed from the bottom of the tube to above the soil line with a heavy layer of asphaltum (roofing tar), shrink wrap PVC tube, or heavy waterproof paint.

Consideration in the design process can reduce maintenance and insure cosmetic attractiveness over a longer period.

Slightly pitch or slant (1" drop per 10 ft. or 0.5° is typical) rectangular or square tube to eliminate standing water or puddling on the tube.

Install watertight caps over all open holes or open the ends of the tube for circulation of air. If open holes or open end tubing cannot be avoided, provide a pitch and drain hole so liquid cannot accumulate on or in the tube.

Where welding is required, use a common carbon steel rod or wire with Allied's galvanized steel tubing. Provide a hole and spray the inside diameter in the general weld area with a zinc rich primer or cold galvanizing compound to cover and restore corrosion protection, then cap the hole. The cap may be reopened, and the joint inspected and resprayed if necessary at a later date.

Fillet all welds where appropriate, and provide a slight pitch to drain away standing water. Protect the weld by removing all flux, clean the area, and metallize with zinc or apply a zinc rich cold galvanizing compound over the weld and surrounding area. The zinc metallizing and/or cold galvanizing compound should cover both the weld and adjacent burned area until the unaffected galvanized coating is touched. Topcoating the metallizing/cold galvanizing compound surface with a bright aluminum (or any appropriate color) paint will additionally seal the surface.

The use of all galvanized or plastic component hardware on the galvanized tube surfaces will insure no metallurgical reaction between components.

Any closely mating joined parts (such as clamping) should be of materials as noted above and painted or otherwise sealed at the joint to prevent the gap or capillary from holding water.

**Note:** Ground anchored tubing or in-ground posts should not be buried unprotected below the soil line.