Galvanize Before Fabrication?

Under ASTM 767 reinforcing bar may be ordered in two manners: as stock bar galvanized prior to fabrication or as fabricated shapes sent to a job galvanizer for coating. Both have their advantages, and where this choice is not dictated by contract documents or specifications either is suitable. ASTM 767 also lists two coating weights options, a Class 1 (5.8 mils) or Class 2 (3.4 mils). While there are no guidelines within the specification regarding applications for Class 1 or Class 2, the thicker Class 1 coating is typical of pre-fabricated material where coating weights tend to be heavier. A Class 2 coating is typically more ductile and may be preferable for pre-galvanized bars going to fabrication as it is likely to exhibit less cracking or flaking of the coating when bent. When no designation is specified, a Class 2 coating is acceptable. The Class 2 coating is equivalent to international standards, which generally reference ISO1461 and specify a coating of 85 *UM,* or 3.35 mils.

While galvanizing after fabrication is the norm in many parts of the country, there are some who express concerns about the effects of cold working and potential development of strain age embrittlement when fabricated bar is subsequently galvanized. Because of this potential, A767 lists various minimum pin diameters for bending different bar sizes prior to galvanizing. (These are listed in A767 table 2) It is also important for fabricators to insure that bending pins and rollers on equipment are free to rotate during bending (if so designed) to reduce cold working stresses. If tighter bend radii than those shown in the table are necessary for pre fabricated work, A767 calls for stress reliving of the material prior to galvanizing. This can create major delays in getting material to the job site.

Pre galvanized lengths of rebar have the advantage of no cold work stresses prior to galvanizing, no need for special pin sizes for bending ,no delays sending material out for coating and a reduced incidence of lost or mixed material as material never leaves the fabricators control. The cut ends and any areas of heavy flaking on bars after bending are touched up in accordance with ASTM780 *Practice for the Repair of hot Dip Galvanized Coatings*, most often using a conforming spray paint which contains at least 94% solids in dry film.

Embrittlement Testing

While A767 does not require embrittlement testing, some State or other agency specifications do call for certain tests to be performed. When mandated, the specification will usually reference procedures in either ASTM 615 (for pre-galvanized bar) or ASTM143 (post galvanized bar). Since these tests are not part of A767 and outside the scope of usual and customary practices at most galvanizing plants, care should be taken to insure that any such tests are discussed with the galvanizer before work commences and that these tests will be performed correctly and will satisfy specification requirements. Costs for such performing such testing may be charged by the galvanizer as an separate service item or rolled into the overall galvanizing cost. Since this testing is destructive, sufficient additional material must be provided to the galvanizer to conduct it. Unless other arrangements are made, embrittlement testing (when required) should be performed by the galvanizer before shipping.