Cold Weather Welding

I once asked a related question of Omer Blodgett at Lincoln Electric. He told me it is a matter of heat input, and there are procedures in AWS D1.1 that address this. His advice to me was that when the weather gets cold, it is the tack welding that requires the most scrutiny because the heating and quenching rates are so much faster in this case.

The technical answer is also available. AWS D1.1 Table 3.2 has minimum temperatures for welding. The table often lists none, but there is a footnote that sets a floor at 32 ºF. If conditions are below that, it is required to raise the steel to 70 ºF via preheating.

Deck welding is covered in AWS D1.3, but it does not require heating. The requirements in that document were based on a study showing that low temperatures do not cause a problem with arc spot welds.

Cha le J. Ca e , S.E., P.E., Ph.D.

Washer Plates for Column Base Plates

14-2 A C *Steel Construction Manual.*

A572-50

A36

Table 14-2 does not indicate the steel grade, but the discussion on "Washer Requirements" on page 14-10 indicates that washers are most typically furnished from A36 material, which is the basis for the table.

The length and width dimensions in Table 14-2 are the minimum recommended dimensions to cover the correlating base plate hole sizes. The minimum plate thickness indicated is selected based on two considerations: (a) the strength required to prevent the anchor rod from pulling through when the base plate is subject to uplift and (b) the stiffness required to prevent "large" displacement when the base plate is subject to uplift. In general, washer thicknesses roughly one-third of the anchor rod diameter meet the stiffness requirement.

Increasing the strength of the washer material to 50 ksi would give you more strength, but making it thinner would reduce your stiffness. That said, if you evaluate the washer strength and stiffness based on your actual anticipated loads, you may be able to change material and reduce the thickness.

S a B mei e , P.E.

Plate Girder Stiffeners

4-3 1989 A C A *Specification,*

Equation G4-3 in the 1989 AISC ASD *S ecifica i* calculated the required shear strength of the welds attaching the transverse stiffeners to the web of a plate girder and read:

The 1989 AISC ASD *S ecifica i* was the last time the equation made an appearance. The Commentary to the 1989 AISC ASD *S ecifica i* states: "The amount of shear to be transferred between web and stiffeners is not affected by the eccentricity of loading and generally is so small that it can be

The design wall thickness (0.93 times the nominal wall thickness) is an estimate of the actual wall thickness provided by manufacturers in the U.S. for electric-resistance-welded HSS. When the design wall thickness is used with the safety factors and resistance factors in the AISC *Specification* (a free download at),