Stability of Beams During Erection

We are erecting a structural steel building with long, slender beams. The beams have significant camber. During erection the beams are acting more like open web joists than beams. As soon as a beam is released from the crane it bows out to the side, resulting in a need for temporary bracing to keep the beams "straight." The design engineer has confirmed that the beams are structurally adequate once the slab on metal deck is poured. Is there a way to anticipate such erection issues?

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Shear Lag

We have two pipes spliced end-to-end using knife plates in the shape of a cross (plates slotted into the pipe wall at each quadrant). This condition is not addressed in AISC *S* *φ* Table D3.1. The pipes are too large (outside diameter of 24 in.) to economically provide the length necessary to satisfy the > 1.3*D* requirement in order to use *U* = 1.0. Relative to tensile rupture of the pipe sections, what is the appropriate shear lag factor, *U*?

You are correct: Table D3.1 does not address this condition, so you will have to rely on your own engineering judgment. Following is some guidance that may help as you do that.

Having two plates as opposed to just one (as shown in Case 5) should help reduce the effects of shear lag considerably. Using a length equal to 1.3 to get a = 1.0 would be very conservative. Instead, you might consider an approach similar to the Whitmore check.

The circumference of a round HSS is π . The Whitmore section for each of your two plates is 4 tan(30°); that is, 2 times 2 tan(30°