

Making Economical Cents Out of ACI 301 WWR Requirements

Background: ACI 117 has never specified tolerances for welded wire reinforcement (WWR), stating in the Mandatory Requirements Checklist that “tolerances for fabrication, placement, and lap splices for welded wire reinforcement must be specified by the Specifier.” Without WWR tolerances in ACI 117, ACI 301 in the 2016 version included tolerances for wire sizes of W4.0 or D4.0 and larger, and support spacing not to exceed 12 in. for wire size less than W4.0 or D4.0. An article in *ACI Concrete International* (September 2006) by Joseph Neuber, “Support Requirements for Welded-Wire Reinforcement in Slabs”, served as the basis for the support requirement of 12 in. or less for smaller wire sizes.

Challenge: For many years contractors used the WWR support spacing recommended by the Wire Reinforcement Institute (WRI) of 2 to 3 ft. or less for wire sizes less than W4.0 or D4.0 and 2 to 6 ft. for larger wire sizes. There is a considerable price difference in using support spacing required by ACI 301 versus that recommended by WRI. In addition, many engineers, contractors and owners are not aware of the ACI 301 WWR requirements. This leads to confusion in bidding and enforcement. Finally, there is still the misconception that WWR prevents cracking, which leads to arguments and unnecessary repairs.

Savvy choices: Many ASCC concrete contractors are excluding the ACI 301 WWR support spacing requirements in their bids. This allows them to be competitive with other contractors who are unaware of this provision and also allows them to discuss the WWR needs and intent with the designer. A concrete contractor on a recent project where WWR, 6 x 6 W2.9xW2.9, was specified for a composite steel deck concrete slab, excluded the ACI 301 WWR provision in his bid. The design team asked the concrete contractor for a price to conform to ACI 301 WWR support spacing of 12 in. The resulting price increase was \$30,000. But the contractor also provided the engineer with another option, increasing the WWR from 6 x 6-W2.9xW2.9 to 6 x 6 – W4.0xW4.0 which only cost \$3,200.

As part of this discussion, the engineer also considered what placement tolerance was needed and increased the WWR placement tolerance which still met the design objective.

Reasonable solution: How does the owner benefit more—\$30,000 of supports or \$3,200 of increased steel that controls cracking? WRI lists common small wire sizes as 1.4, 2.0 and 2.9, but in light of the ACI 301 WWR requirements, these should not be specified. Put the money into an owner benefit—crack control, and increase the wire size to at least 4.0. That is the only solution that makes economical cents with the current ACI 301 WWR requirements.