

Location of Welded-Wire Reinforcement in Concrete Slabs

ASCC Position Statement #2

Some specifications require concrete contractors to use welded-wire reinforcement (WWR) in slabs-on-grade, topping slabs, and composite slabs on metal decking. Construction drawings usually show WWR sheets placed 2 in. below the slab surface or within the upper third of the slab thickness. Even with closely spaced bolsters, chairs, or support bars it is extremely difficult to ensure that the WWR is placed in the specified position and remains there during concrete placement. This is especially true when using WWR of size 4.0 or smaller (Neuber, *Concrete International*, Sept. 2006, pp. 39-41).

Use of rolled welded-wire reinforcement is even more problematic. Rolls are straightened before use, but the resulting shape is a wavy profile that means WWR location is variable even if it isn't moved out of location by workers' foot traffic.

ACI 302.1R-04, "Guide for Concrete Floor and Slab Construction," recommends that WWR not be laid on the ground and "pulled up" after the concrete is placed nor "walked in" after placing the concrete. ACI 302 recommends using supports or support bars to maintain the proper elevation, but states that the support bars should be spaced close enough so the welded-wire reinforcement cannot be forced out of location by foot traffic. As shown by Neuber, the cost of bolsters for W1.4 through W4 wire sizes spaced at 6 in. both ways can exceed the cost of the WWR. When support bars are used, the cross-sectional area of such support bars is about equal to the area provided by the WWR. In these cases, use bars instead of WWR.

There is some confusion regarding the role of WWR. Neither wire reinforcement nor reinforcing bars prevent cracking. Reinforcement isn't active until the concrete cracks, and then

the reinforcement simply limits crack width and thus affects crack spacing.

Bar placing tolerances given in ACI 117-10, "Standard Specifications for Tolerances for Concrete Construction and Materials," don't apply to the placing of WWR in either sheets or rolls. The Commentary sections R2.2.1, R2.2.2, and R2.2.3 state that "Tolerances for fabrication, placement, and lap splices for welded-wire reinforcement are not covered by ACI 117 and, if required, should be specified by the Specifier." Mandatory Specification Checklist in ACI 117-10, "Notes to the Architect/Engineer," states, "Tolerances for fabrication, placement, and lap splices for welded-wire reinforcement must be specified by the specifier." Thus, tolerances for either rolled or sheet WWR must be specifically called out in the project specifications.

ASCC concrete contractors will use sheet or rolled WWR of size 4.0 or smaller if required by specification, but only with the acknowledgement that the risk associated with the location of the reinforcement is entirely the responsibility of the specifier. ASCC concrete contractors recommend using sheets of WWR with size 4.0 wire or larger and with spacings of 12 in. or greater to allow for construction foot traffic.

If you have any questions, contact your ASCC concrete contractor or the ASCC Technical Hotline at (800) 331-0668.

Note: This Position Statement supersedes ASCC Position Statement No. 2 published in *Concrete International* in February 2003.



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