

Testing Fresh Concrete at Point of Delivery

Confusion occasionally arises at the project site when the pre-pour concrete conference does not adequately address the location of testing fresh concrete. ACI 301-99, “Specifications for Structural Concrete,” requires the slump and air content to be measured at the point of delivery. ACI 301 addresses the issues of measuring slump and air content at the point of placement in the Optional Requirements Checklist for Section 4.2.2.2:

“It might be necessary at times to specify that the slump of concrete be determined at the point of placement rather than at the point of delivery. For example, pumped concrete is often specified to have slump measured at the end of the pumpline to preclude problems encountered with varying slump loss during pumping. This would provide for a slump higher than 4 in. at the point of delivery to obtain 4 in. slump at the end of the pumpline. Once the slump loss during pumping can be determined, acceptance or rejection of concrete based on slump can then be determined at the delivery point. For example, if a 1-1/2 in. slump loss during pumping has been established and confirmed by comparative testing, then the slump can be measured at the point of delivery to meet a 5-1/2 in. slump to meet the 4 in. slump requirement at the point of placement at the end of the pumpline.”

For the same reasons as described on the Optional Requirements Checklist to 4.2.2.2, it may be necessary to specify that air content be measured at the point of placement to account for loss of air content during pumping. Once the loss of air content during pumping is established, acceptance limits at the point of delivery can be determined.

ASCC concrete contractors prefer to test fresh concrete at the point of delivery and, when necessary, to

perform comparative testing that determines the effect of placement method on slump and air content. As ACI 301 suggests, comparative tests allow point-of-delivery acceptance limits to be set. Testing fresh concrete at the point of delivery is safer for the technician, typically provides a more stable and comfortable work area to ensure that ASTM testing standards are met, and results in a more continuous flow of concrete that minimizes the potential for concrete segregation and cold joints.

Using the same acceptance limits at both the point of delivery and the point of placement violates the implied intent of the approach suggested in the ACI 301 Optional Requirements Checklist to 4.2.2.2. As noted, meeting the 4 in. (100 mm) slump requirement when there's a 1-1/2 in. (40 mm) slump loss in the pumpline might require an initial slump at the point of delivery of 5-1/2 in. (140 mm), which is outside the acceptance limits of ACI 301. The acceptance limits thus apply to only one testing location—either the point of delivery or point of placement.

When comparative testing is used to establish the acceptance limits at the point of delivery, make sure that adequate tolerances for both slump and air content are considered as required in ACI 117-90, “Standard Specifications for Tolerances for Concrete Construction and Materials.” When adjusting slump, ACI 301 permits adding water up to the amount allowed in the accepted mixture proportions and increasing the water-reducing admixture dosage.

ASCC concrete contractors will work with all parties in addressing these issues. If you have any questions, contact your ASCC concrete contractor or the ASCC Technical Hotline at (800) 331-0668.