

Code and Cement Type

Q. *I'm designing a building for an owner who has asked for the concrete to comprise a cement product that I have not specified on other projects. According to the manufacturer of this product, it qualifies as hydraulic cement and uses a non-portland, activated fly ash system. Does the ACI 318 Code cover concrete with this cement type? Does the Code include any qualifiers for alternative cements with regard to reinforcing corrosion resistance, bond strength, or anchorage provisions?*

A. ACI 318-14¹ defines concrete as “mixture of portland cement or any other cementitious material, fine aggregate, coarse aggregate, and water, with or without admixtures.” The code also defines cementitious materials as “materials that have cementing value if used in concrete either by themselves, such as portland cement, blended hydraulic cements, and expansive cement; or such materials in combination with fly ash, other raw or calcined natural pozzolans, silica fume, and slag cement.” So, the described product would fall into that category. Note, however, that ACI Committee 318 does not endorse any products, and thus the Code does not provide a list of approved materials. Instead, the Code indicates ASTM standards that must be met by a product. In this case, the alternative cement must comply

with ASTM C1157/C1157M-11, “Standard Performance Specification for Hydraulic Cement.”

Note that you must also check the exposure requirements for the concrete placements on this project. If your project specifications assign any concrete placements to Exposure Class F3 (concrete exposed to freezing-and-thawing cycles with frequent exposure to water and exposure to deicing chemicals), Section 26.4.2.2 of ACI 318-14 limits the amount of pozzolans, including fly ash, to 25% by mass of total cementitious materials. However, Section 1.10.1 of ACI 318-14 allows a sponsor to present data demonstrating the adequacy of a product “by successful use or by analysis or test” to the building official or a board of examiners appointed by the official. The final decision rests with the building official.

References

1. ACI Committee 318, “Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary on Building Code Requirements for Structural Concrete (ACI 318R-14),” American Concrete Institute, Farmington Hills, MI, 2014, 519 pp.

Note: Additional information on the ASTM standard discussed in this article can be found at www.astm.org.

Questions in this column were asked by users of ACI documents and have been answered by ACI staff or by a member or members of ACI technical committees. The answers do not represent the official position of an ACI committee. Only a published committee document represents the formal consensus of the committee and the Institute.

We invite comment on any of the questions and answers published in this column. Write to the Editor, *Concrete International*, 38800 Country Club Drive, Farmington Hills, MI 48331; contact us by fax at +1 248 848-3701; or e-mail Rex.Donahey@concrete.org.