

Design of Slabs-on-Ground

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This document presents information on the design of slabs-on-ground, primarily industrial floors. The report addresses the planning, design, and detailing of slabs. Background information on design theories is followed by discussion of the types of slabs, soil-support systems, loadings, and jointing. Design methods are given for unreinforced concrete, reinforced concrete, shrinkage-compensating concrete, post-tensioned concrete, fiber-reinforced concrete slabs-on-ground, and slabs-on-ground in refrigerated buildings, followed by information on shrinkage and curling problems. Advantages and disadvantages of each of these slab designs are provided, including the ability of some slab designs to minimize cracking and curling more than others. Even with the best slab designs and proper construction, however, it is unrealistic to expect crack-free and curl-free floors. Consequently, every owner should be advised by both the designer and contractor that it is normal to expect some amount of cracking and curling on every project, and that such occurrence does not necessarily reflect adversely on either the adequacy of the floor's design or the quality of its construction. Design examples appear in an appendix.

Keywords: concrete; curling; design; floors-on-ground; grade floors; industrial floors; joints; load types; post-tensioned concrete; reinforcement (steel, fibers); shrinkage; shrinkage-compensating; slabs; slabs-on-ground; soil mechanics; shrinkage; warping.

ACI Committee Reports, Guides, Standard Practices, and Commentaries are intended for guidance in planning, designing, executing, and inspecting construction. This document is intended for the use of individuals who are competent to evaluate the significance and limitations of its content and recommendations and who will accept responsibility for the application of the material it contains. The American Concrete Institute disclaims any and all responsibility for the stated principles. The Institute shall not be liable for any loss or damage arising therefrom.

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