

ACI 303R-12

**Guide to Cast-in-Place
Architectural Concrete Practice**

Reported by ACI Committee 303



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Guide to Cast-in-Place Architectural Concrete Practice

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The committee would like to thank the late Louis Tallarico for his contribution to this guide.

This guide presents recommendations for producing cast-in-place architectural concrete. The importance of specified materials, forming, concrete placement, curing, additional treatment, inspection, and their effect on the appearance of the finished product are discussed. Architectural concrete requires special construction techniques, materials, and requirements that are unique to each project. The specific recommendations and information presented in this guide should be used accordingly.

Keywords: admixture; aggregate; architectural concrete; bush-hammer; cement; coating; column; consolidation; cracking; curing; deflection; exposed-aggregate finish; finish; form lining; formwork; joint; joint sealant; mixture proportion; pigment; placing quality control; release agent; repair; retarder; sealant; texture; wall.

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CHAPTER 1—INTRODUCTION

This guide presents recommendations for cast-in-place architectural concrete that is exposed to view. Architectural concrete requires special care in the selection of concrete materials, forming, placing, and finishing to achieve the desired architectural appearance. Refer to the photos in

Appendix A for examples of architectural cast-in-place concrete. Various procedures are recommended for determining requirements of the architect, contractor, concrete producer, and inspector. Critical areas are indicated for special attention, and means for prevention or correction of defects are discussed. Specific surface treatments and special forming techniques are presented. Applicable codes, specifications, and recommendations are given. A good resource for general information about architectural concrete can be found in several papers published in *Concrete International* (1984(a) to (i); 1988(a) to (h)), as well as the *Concrete Construction Engineering Handbook* (Kenny and Freedman 1997).

The information presented in this guide is broad and covers several special conditions for specific architectural concrete. Information that may be applicable for use in producing a specific result may not be applicable to another. The user should also be aware that recommendations in this guide are subjective to the means and methods used for accomplishing a specific task for a specific level of architectural effect, and should be tested before use to ensure it will produce the required result. Further research is needed to provide additional information on surface air voids and other construction problems. This guide does not address all the problems associated with architectural concrete.

CHAPTER 2—DEFINITIONS

ACI provides a comprehensive list of definitions through an online resource, “ACI Concrete Terminology,” (<http://terminology.concrete.org>). Definitions provided herein complement that resource.

blemish—any superficial defect that causes visible variation from a consistently smooth and uniformly colored surface of hardened concrete.

checking—development of shallow cracks at closely spaced but irregular intervals on the surface of plaster, cement paste, mortar, or concrete.

concrete, architectural—concrete that will be permanently exposed to view and therefore requires special care in the selection of the concrete materials, forming, placing, and finishing to obtain the desired architectural appearance.

concrete, cast-in-place—concrete that is deposited and allowed to harden in the place where it is required to be in the completed structure, as opposed to precast concrete.

concrete, exposed—concrete surfaces formed so as to yield an acceptable texture and finish for permanent exposure to view. (Refer to **concrete, architectural**.)

finish, exposed-aggregate—a decorative finish for concrete work achieved by removing, generally before the concrete has fully hardened, the outer skin of mortar and exposing the coarse aggregate.

finish, rubbed—a finish obtained by using an abrasive to remove surface irregularities from concrete. (Refer to **sack rub**.)

mottling—uneven color shading or blotchiness across a surface.

quality control—actions taken by an organization to provide control and documentation over what is being done and what is being provided so that the applicable standard of