

IN-LB

Inch-Pound Units

SI

International System of Units

# Decorative Concrete— Guide

Reported by Joint ACI-ASCC Committee 310

ACI/ASCC PRC-310-25



American Concrete Institute  
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**AMERICAN SOCIETY OF  
CONCRETE CONTRACTORS**  
Enhancing the Capabilities of Those Who Build with Concrete



## Decorative Concrete—Guide

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## Decorative Concrete—Guide

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*This guide describes techniques for imparting aesthetic finishes to concrete flatwork, of which many can be combined for unique effects. The owner and architect/engineer will acquire detailed, practical guidance for achieving aesthetic effects using proven techniques. Recommendations are made for the production of cast-in-place decorative concrete flatwork, decorative stains, and overlays. In addition to attention to the specified materials, mixture designs, concrete placement, curing, protection, sealing, and other treatments, this guide also considers the effects of these treatments on the overall aesthetics of the project.*

**Keywords:** cementitious overlays; dry-shake hardeners; embossing; engraving; etching; inlays; polishing; release agents; stains; stamping; tooling.

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### CHAPTER 1—INTRODUCTION AND SCOPE

#### 1.1—Introduction

Decorative concrete has been in existence since approximately 70 A.D., when concrete was used for defining affluent or important areas of living space in communal cultures ([ConcreteNetwork.com](http://ConcreteNetwork.com) 2019). Early examples of this type of adornment are the streets and paving throughout the city of Pompeii near Naples, Italy. Early decorative concrete used colored aggregates and varying shapes or natural materials embedded in concrete paving.

Traditionally, concrete has been specified more for its functional characteristics than as an enhancement to the aesthetics. Landscape architects were leaders in using concrete flatwork to enhance the visual appeal of hardscapes. Using color and texture introduced concrete as a landscape feature in addition to its functionality. An example is flatwork textured and colored to replicate the look of slate, brick, or natural stone, as shown in Fig. 1.1a and 1.1b.

The use of decorative concrete has been well received and is considered an alternative to other building materials for durable, versatile, and economical finishes. Designers are creating greater aesthetic appeal in projects by using one or more combinations of special concrete placement techniques, including integral concrete colors, color hardeners, chemical stains, pigments and dyes, surface texturing, jointing, exposed aggregate, surface embossing, polishing, and the use of sealants and coatings. The combinations of techniques and mediums described in this guide are exclusive; they cannot be replicated by any other durable medium.

#### 1.2—Scope

This guide describes several techniques for imparting aesthetic finishes to concrete, many of which can be



Fig. 1.1a—Stamped, colored concrete with slate and brick patterns in landscape setting (courtesy of *Decorative Concrete Resources*).



Fig. 1.1b—Concrete slab enhances design aesthetic with mimic of stone slab (courtesy of L. M. Scofield Company).



Fig. 1.2a—Cast-in-place decorative concrete combining treatments during and after placement to achieve aesthetic effects (courtesy of Concrete Mystique Engraving).

combined for unique effects (Fig. 1.2a and 1.2b). This guide provides detailed practical guidance for achieving aesthetic effects using proven techniques, both within and beyond the context of **ACI PRC-302.1**, which also describes these concrete elements.

Recommendations for the production of cast-in-place decorative concrete, stains, and overlays are presented. In addition to materials, mixture proportions, placement, curing, protection, sealing, and other treatments, the effects



Fig. 1.2b—Decorative concrete applications such as post-placement colorants can complement or enhance the overall aesthetics of a project (courtesy of PROSOCO).

of these treatments on the overall aesthetics of the structure are also addressed.

## CHAPTER 2—DEFINITIONS

Please refer to the latest version of “ACI Concrete Terminology” for a comprehensive list of definitions. Definitions provided herein complement that resource.

**broadcast**—to toss granular material such as dry-shake color hardener, sand, or decorative aggregate over a horizontal surface so that a thin, uniform layer is obtained.

**burnishing**—enhancing the surface sheen of existing concrete by using high-speed rotational equipment with a minimum of 1500 rpm.

**color hardener**—blend of powdered material formulated with cement, metallic oxide pigments, and fine aggregates to harden and color the concrete surface.

**concrete dye**—translucent colorant that penetrates into fully cured concrete or cement-based overlays while suspended in a water- or solvent-based solution, resulting in a stained appearance; concrete dyes do not produce color through chemical reaction.

**crack chaser**—rotary tool using a V- or U-shaped diamond blade to prepare cracks in concrete to facilitate repair.

**decorative aggregate**—specially selected aggregates ranging in size chosen for their artistic contribution to the project.

**decorative overlay**—bonded layer of cementitious materials installed over an existing concrete substrate to enhance, level, or restore.

**densifier**—combination of silicate or nonsilicate compounds in a water-based solution that react in the surface of the concrete to produce additional calcium silicate hydrate (C-S-H).

**efflorescence**—a generally white deposit formed when water-soluble compounds emerge in solution from concrete, masonry, or plaster substrates and precipitate by reaction such as carbonation or crystallize by evaporation.