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Inch-Pound Units

SI

International System of Units

# Visual Condition Survey of Concrete—Guide

Reported by ACI Committee 228

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## Visual Condition Survey of Concrete—Guide

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# Visual Condition Survey of Concrete—Guide

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*This guide provides guidance on planning, performing, and documenting visual condition surveys of concrete structures. Chapter 1 defines the objective and scope of this guide and Chapter 2 covers terminology. Chapter 3 includes the process and tools one would use to plan and conduct a condition survey. Chapter 4 provides an image library and associated descriptions of the visual features that may be encountered when conducting the survey. Chapters 5*

*through Chapter 7 discuss the likely causes of the various features one might see when performing a visual condition survey.*

**Keywords:** condition survey; construction defects; cracking; deterioration; durability-related distress; surface features; survey documentation; visual survey.

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### CHAPTER 1—INTRODUCTION AND SCOPE

#### 1.1—Introduction

Generally conducted as part of a field investigation, a visual condition survey of concrete aids in assessing the condition and performance of the structure. A visual condition survey of concrete can be conducted throughout the life of a concrete structure.

Visual condition surveys performed at the completion of construction and routinely performed during the service life of a structure provide important information that can aid in assessing a structure's performance and durability. A single survey or a collection of surveys can aid in the early detec-

tion of distress conditions and deterioration, prompting repair or rehabilitation before replacement is necessary.

An individual conducting the visual condition survey should identify physical features observed and document their extent and location on the structure. This document provides guidance for conducting a visual condition survey and understanding the potential phenomena causing the visual features.

#### 1.2—Objective and scope

Visual condition surveys involve visual examination of a concrete element for the purpose of identifying surface and geometrical features and documenting their physical extent. It is limited to the visible surfaces of the concrete.

This guide is intended to assist the person conducting the visual condition survey to plan and execute the survey, to understand common features that may be visible during a survey, and to document the results of the survey. **Chapter 3** presents methodologies to conduct the survey. **Chapter 4** defines common features that may be encountered in a condition survey and provides photographs to illustrate some of these features to aid in their identification. **Chapters 5 to 7** summarize the factors that can lead to the manifestation of various features related to construction, in-service conditions, and durability. The summaries are intended to assist the reader in better understanding and interpreting observations of a condition survey. References are provided to other published information to further aid the reader.

### CHAPTER 2—DEFINITIONS

#### 2.1—Definitions

Please refer to the latest version of ACI Concrete Terminology for a comprehensive list of definitions. Definitions provided herein complement that resource. Additionally, Chapter 4 of this guide provides a glossary of terms used to characterize visible features that may be encountered during a visual survey of concrete elements, many of which are defined in ACI Concrete Terminology. Some of the features listed in Chapter 4 are accompanied with illustrative photographs. The definitions provided in Chapter 4 also complement ACI Concrete Terminology.

### CHAPTER 3—VISUAL CONDITION SURVEY PROCESS

A visual condition survey is a nondestructive evaluation using the human eye and basic supplemental tools as instruments. It is generally conducted as part of a field investigation. A field investigation may be requested by an agency or owner to document the type and extent of visible damage present in a structure. A field investigation can be divided into three primary tasks: 1) preparation and planning; 2) on-site verification of the accuracy of gathered information; and 3) conducting a visual condition survey of the structure. The visual condition survey includes: 1) identifying visible features; 2) documenting their location on the structure or element; and 3) documenting their approximate extent and severity (**ACI 364.1R**).