IN-LB	Inch-Pound Units
SI	International System of Units

Guide to Formwork for Concrete

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Always advancing

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Guide to Formwork for Concrete

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American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331
Phone: +1.248.848.3700
Fax: +1.248.848.3701

www.concrete.org

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Guide to Formwork for Concrete

Reported by ACI Committee 347

Kenneth L. Berndt, Chair

Rodney D. Adams
Mary Bordner-Tanck
George Charitou
Eamonn F. Connolly
James N. Cornell II
Jack L. David
Aubrey L. Dunham
Jeffrey C. Erson
Noel J. Gardner
Brian J. Golanowski
Timothy P. Hayes
Gardner P. Horst
Jeffery C. Jack
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Roger S. Johnston
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Robert G. McCracken
Eric S. Peterson
Steffen Pippig
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Douglas J. Schoonover
Aviad Shapira
John M. Simpson
Rolf A. Spahr
Pericles C. Stivaros
Daniel B. Toon
Ralph H. Tulis

Consulting Members
Samuel A. Greenberg
R. Kirk Gregory

Objectives of safety, quality, and economy are given priority in these guidelines for formwork. A section on contract documents explains the kind and amount of specification guidance the engineer/architect should provide for the contractor. The remainder of the guide advises the formwork engineer/contractor on the best ways to meet the specification requirements safely and economically. Separate chapters deal with design, construction, and materials for formwork. Considerations specific to architectural concrete are also outlined in a separate chapter. Other sections are devoted to formwork for bridges, shells, mass concrete, and underground work. The concluding chapter on formwork for special methods of construction includes slipforming, preplaced-aggregate concrete, tremie concrete, precast concrete, and prestressed concrete.

Keywords: anchors; architectural concrete; coatings; construction; construction loads; contract documents; falsework; form ties; forms; formwork; foundations; quality control; reshoring; shoring; slipform construction; specifications; tolerances.

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Reference to this document shall not be made in contract documents. If items found in this document are desired by the Architect/Engineer to be a part of the contract documents, they shall be restated in mandatory language for incorporation by the Architect/Engineer.

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CHAPTER 1—INTRODUCTION AND SCOPE

1.1—Introduction

Many individuals, firms, and companies are usually involved in the design of the facility to be built and in the design and construction of the formwork. The facility team typically involves structural engineers and architects who determine the requirements for the concrete structure to be built. For simplicity, the facility design team will usually be referred to as the engineer/architect, although they may be referred to separately in some situations. The formwork team may include the general contractor, formwork specialty subcontractors, formwork engineers, form manufacturers, and form suppliers. The participating companies and firms also have form designers and skilled workers executing many detailed tasks. For simplicity, the formwork team will usually be referred to as the formwork engineer/contractor, although they may be referred to separately in some situations.

This guide is based on the premise that layout, design, and construction of formwork should be the responsibility of the formwork engineer/contractor. This is believed to be fundamental to the achievement of safety and economy of formwork and of the required formed surface quality of the concrete.

The paired values stated in inch-pound and SI units are usually not exact equivalents. Therefore, each system is to be used independently of the other.

1.2—Scope

This guide covers:

a) A listing of information to be included in the contract documents

b) Design criteria for horizontal and vertical loads on formwork

c) Design considerations, including safety factors for determining the capacities of formwork accessories

d) Preparation of formwork drawings

e) Construction and use of formwork, including safety considerations

f) Materials for formwork

g) Formwork for special structures

h) Formwork for special methods of construction

CHAPTER 2—NOTATION AND DEFINITIONS

2.1—Notation

C_{CP} = concrete lateral pressure, lb/ft^2 (kPa)
C_c = chemistry coefficient
C_w = unit weight coefficient
c_1 = slipform vibration factor, lb/ft^2 (kPa)
g = gravitational constant, 0.00981 kN/kg
h = depth of fluid or plastic concrete from top of placement to point of consideration in form, ft (m)
R = rate of placement, ft/h (m/h)
T = temperature of concrete at time of placement, °F (°C)
w = unit weight of concrete, lb/ft^3
ρ = density of concrete, kg/m^3

2.2—Definitions

The ACI Concrete Terminology provides a comprehensive list of definitions. The definitions provided herein complement that source.

backshores—shores left in place or shores placed snugly under a concrete slab or structural member after the original formwork and shores have been removed from a small area, without allowing the entire slab or member to deflect or support its self-weight and construction loads.

brace—structural member used to provide lateral support for another member, generally for the purpose of ensuring stability or resisting lateral loads.

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