Specification for Tolerances for Concrete Construction and Materials (ACI 117-10) and Commentary
An ACI Standard

Reported by ACI Committee 117

American Concrete Institute®
Specification for Tolerances for Concrete Construction and Materials (ACI 117-10) and Commentary
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Specification synopsis: This specification provides standard tolerances for concrete construction and materials. This document is intended to be used by specification writers and ACI committees writing standards as the reference document for establishing tolerances for concrete construction and materials.

Commentary synopsis: This report is a commentary on the “Specifications for Tolerances for Concrete Construction and Materials (ACI 117).” It is intended to be used with ACI 117 for clarity of interpretation and insight into the intent of the committee regarding the application of the tolerances set forth therein.

Keywords: architectural concrete; concrete; construction; drilled piers; formwork; foundation; mass concrete; pier; precast concrete; prestressed concrete; reinforced concrete; reinforcement; specification; splice; tilt-up concrete; tolerances.

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ACI 117 Specification and Commentary are presented in a side-by-side column format, with code text placed in the left column and the corresponding commentary text aligned in the right column. To distinguish the specification from the commentary, the specification has been printed in Helvetica, which is the typeface for this paragraph.

The Commentary is printed in Times Roman, which is the typeface for this paragraph. Commentary section numbers are preceded by the letter “R” to distinguish them from specification section numbers. The commentary is not a part of ACI Specification 117-10.
CONTENTS

Introduction, p. 117-3

Section 1—General requirements, p. 117-5
  1.1—Scope
  1.2—Requirements
  1.3—Definitions
  1.4—Referenced standards

Section 2—Materials, p. 117-13
  2.1—Reinforcing steel fabrication and assembly
  2.2—Reinforcement location
  2.3—Placement of embedded items, excluding dowels in slabs-on-ground
  2.4—Concrete batching
  2.5—Concrete properties

Section 3—Foundations, p. 117-25
  3.1—Deviation from plumb
  3.2—Deviation from location
  3.3—Deviation from elevation
  3.4—Deviation from plane
  3.5—Deviation from cross-sectional dimensions of foundations

Section 4—Cast-in-place concrete for buildings, p. 117-31
  4.1—Deviation from plumb
  4.2—Deviation from location
  4.3—Not used
  4.4—Deviation from elevation
  4.5—Deviation from cross-sectional dimensions
  4.6—Deviation from formed opening width or height
  4.7—Deviation from relative elevations or widths for stairs
  4.8—Deviation from slope or plane
  4.9—Sawcut depth in slab-on-ground

Section 5—Cast-in-place concrete at interface with precast concrete (except tilt-up concrete), p. 117-45
  5.1—Deviation from elevation—cast-in-place concrete
  5.2—Deviation from location—cast-in-place concrete
  5.3—Deviation from dimension—cast-in-place concrete
  5.4—Deviation from plane at bearing surface—cast-in-place concrete measured over length or width of bearing surface

Section 6—Masonry, p. 117-51
  This section has been removed.

Section 7—Cast-in-place, vertically slipformed building elements, p. 117-53
  7.1—Deviation from plumb for buildings and cores
  7.2—Horizontal deviation
  7.3—Cross-sectional dimensions
  7.4—Openings through elements
  7.5—Embedded plates
  7.6—Deviation from plumb for slipformed and jump-formed silos

Section 8—Mass concrete, p.117-55
  8.1—Deviation from plumb

  8.2—Horizontal deviation
  8.3—Vertical deviation
  8.4—Cross-sectional dimension
  8.5—Deviation from plane

Section 9—Canal lining, p. 117-57
  9.1—Horizontal deviation
  9.2—Vertical deviation
  9.3—Cross-sectional dimensions

Section 10—Monolithic water-conveying tunnels, siphons, conduits, and spillways, p. 117-59
  10.1—Horizontal deviation
  10.2—Vertical deviation
  10.3—Cross-sectional dimensions
  10.4—Deviation from plane

Section 11—Cast-in-place bridges, p. 117-61
  11.1—Deviation from plumb
  11.2—Horizontal deviation
  11.3—Vertical deviation
  11.4—Length, width, or depth of specified elements
  11.5—Deviation from plane
  11.6—Deck reinforcement cover
  11.7—Bearing pads

Section 12—Exterior pavements and sidewalks, p. 117-63
  12.1—Horizontal deviation
  12.2—Vertical deviation of surface

Section 13—Chimneys and cooling towers, p. 117-65
  13.1—Deviation from plumb
  13.2—Outside shell diameter
  13.3—Wall thickness

Section 14—Cast-in-place nonreinforced pipe, p.117-67
  14.1—Wall thickness
  14.2—Pipe diameter
  14.3—Offsets
  14.4—Surface indentations
  14.5—Grade and alignment
  14.6—Concrete slump

Section 15—Tilt-up concrete, p. 117-69
  15.1—Panel forming
  15.2—Deviation from plumb
  15.3—Deviation from elevation
  15.4—Deviation from location
  15.5—Deviation from slope or plane
  15.6—Deviation from relative widths

Notes to Specifier, p. 117-73
  General notes

Foreword to checklists, p. 117-75

Mandatory Requirements Checklist, p. 117-75

Optional Requirements Checklist, p. 117-76
INTRODUCTION

SPECIFICATION

COMMENTARY

This commentary pertains to “Specifications for Tolerances for Concrete Construction and Materials (ACI 117-10).” The purpose of the commentary is to provide an illustrative and narrative complement to the specification; it is not a part of the specification.

No structure is exactly level, plumb, straight, and true. Tolerances are a means to establish permissible variation in dimension and location, giving both the designer and the contractor limits within which the work is to be performed. They are the means by which the designer conveys to the contractor the performance expectations upon which the design is based or that the project requires. Such specified tolerances should reflect design assumptions and project needs, being neither overly restrictive nor lenient.

Necessity rather than desirability should be the basis of selecting tolerances.

As the title “Specifications for Tolerances for Concrete Construction and Materials (ACI 117)” implies, the tolerances given are standard or usual tolerances that apply to various types and uses of concrete construction. They are based on normal needs and common construction techniques and practices. Specified tolerances at variance with the standard values can cause both increases and decreases in the cost of construction.

Economic feasibility—The specified degree of accuracy has a direct impact on the cost of production and the construction method. In general, the higher degree of construction accuracy required, the higher the construction cost, and the lower the degree of construction accuracy, the higher the cost of required repairs.

Relationship of all components—The required degree of accuracy of individual parts can be influenced by adjacent units and materials, joint and connection details, and the possibility of the accumulation of tolerances in critical dimensions.

Construction techniques—The feasibility of a tolerance depends on available craftsmanship, technology, materials, and project management.

Compatibility—Designers are cautioned to use finish and architectural details that are compatible with the type and anticipated method of construction. The finish and architectural details used should be compatible with achievable concrete tolerances.