ACI ITG-7-09

Specification for Tolerances for Precast Concrete

An ACI Standard

Reported by ACI Innovation Task Group 7

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This Reference Specification provides standard tolerances for precast concrete construction. It covers dimensional tolerances for precast concrete members used in building construction, and it covers erection tolerances for these members. This document is intended to be adopted by reference in Contract Documents. The Specifier supplements the provisions of this Reference Specification as needed by specifying project-specific requirements in Contract Documents.

Keywords: alignment; construction; erection tolerances; precast concrete; prestressed concrete; product tolerances; reinforcement; specification.

CONTENTS

(mandatory portion follows)

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(mandatory portion follows)

SECTION 1—GENERAL REQUIREMENTS

1.1—Scope

1.1.1 *Work specified*—This Specification designates standard tolerances for structural and architectural precast concrete members. Tolerances are provided for individual members and their erection. The indicated tolerances govern unless otherwise specified.

1.1.2 *Work not specified*—Interface tolerances between precast concrete members and cast-in-place concrete construction are specified in ACI 117.

1.1.3 *Units*—Values in this specification are stated in inch-pound units. A companion specification in SI units is also available.

1.2—Requirements

1.2.1 *Accumulation of tolerances*—Tolerances are not cumulative. Accumulations of individual tolerances on a single item shall not be used to increase an established tolerance. Individual tolerances are unique to their specific application and shall not be combined with other tolerances to form a tolerance envelope. The most restrictive tolerance controls.

1.2.2 *Sign definition*—Plus (+) tolerance increases the dimension or elevation to which it applies. Minus (–) tolerance decreases the dimension or elevation to which it applies.

1.2.3 *Exceeding tolerances*—If the product and erection tolerances in this document are exceeded, the member or the modified assembly shall be accepted if the following conditions are met:

(a) The Licensed Design Professional determines that the structural requirements have been satisfied.

(b) The Owner or Architect accepts the appearance of exposed surfaces.

1.3—Definitions

Architect/Engineer—the architect, engineer, architectural firm, or engineering firm developing Contract Documents or administering the Work under Contract Documents, or both.

bearing width overhang—distance from the side of precast concrete member to side of bearing media, that is, pad or shim, measured perpendicular to the direction of the span, as shown in Fig. 1.1.

blockout—opening through the member for conduit, piping, ductwork, connections, or structural framing.

bowing—the deviation of the edge or surface of a planar wall member, in the out-of-plane direction, from a line passing through any two corners of the member, as shown in Fig. 1.2.

camber—deviation of the bottom of the member from a line between the bottom ends of that member due to the effects of the prestress force.

Contract Documents—a set of documents supplied by Owner to Contractor as the basis for construction; these documents contain contract forms, contract conditions, specifications, drawings, addenda, and contract changes.

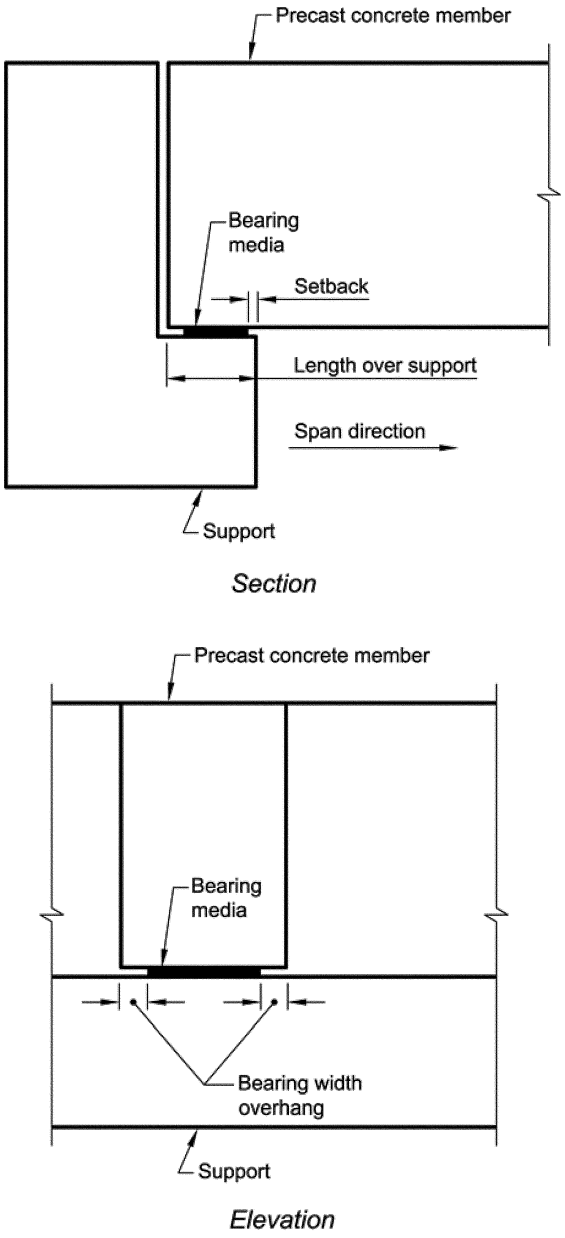

Fig. 1.1—Length over support and bearing width overhang.

control surface, primary—the member surface deemed to be critical to the fit and function of interfacing members or to the appearance of the completed project.

cover—the least distance between the surface of embedded reinforcement and the surface of the concrete.

deviation—distance from an established reference point, line, or surface measured perpendicular to the line or surface of the member.

deviation from plane—distance between a point on a reference plane and the corresponding point on the actual surface of the member.

deviation, horizontal—distance from an established point, line, or surface measured perpendicular to a vertical line through the point of interest.

deviation, vertical—distance from an established point, line, or surface measured perpendicular to a horizontal line through the point of interest.

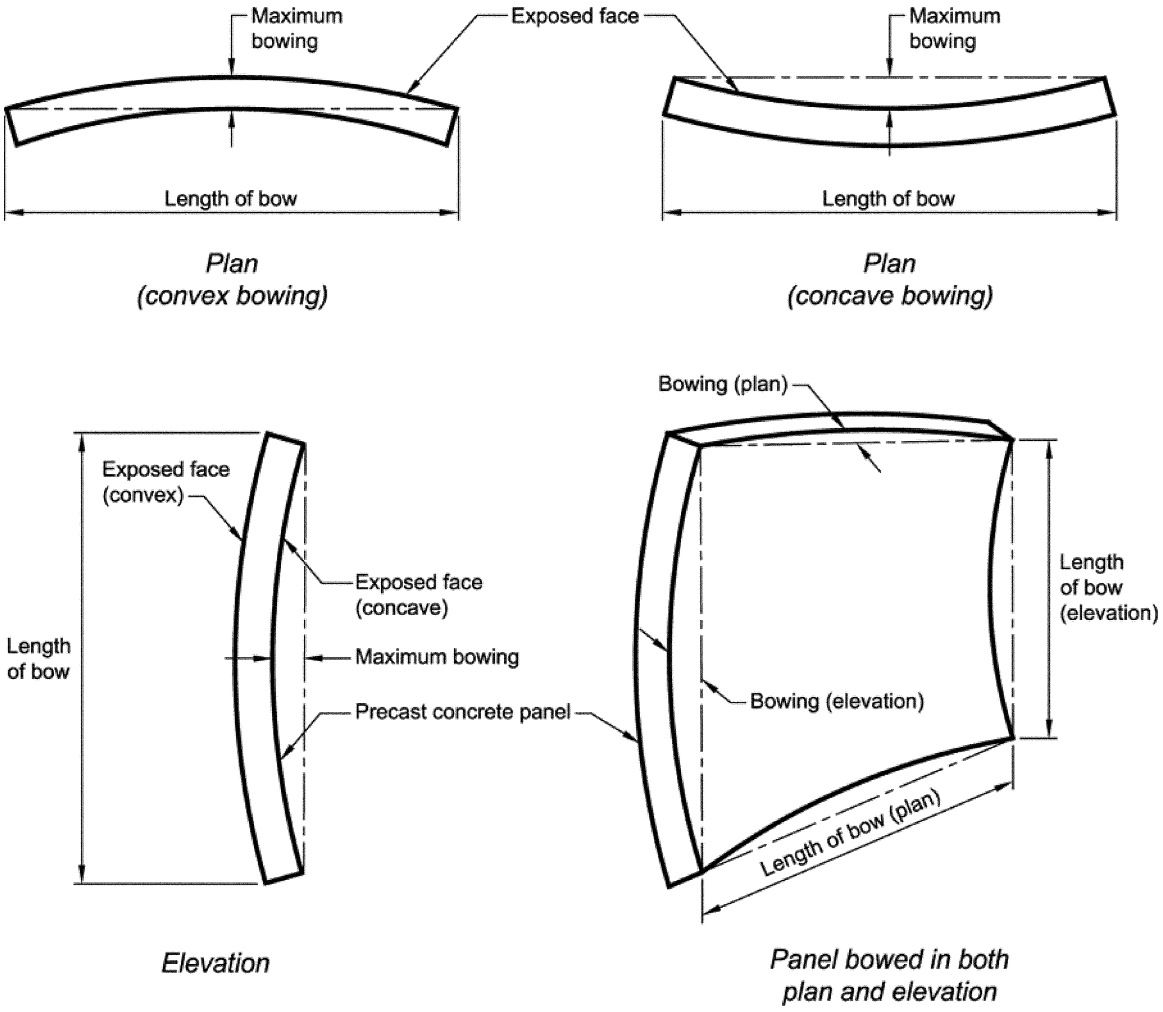

Fig. 1.2—Panel bowing.

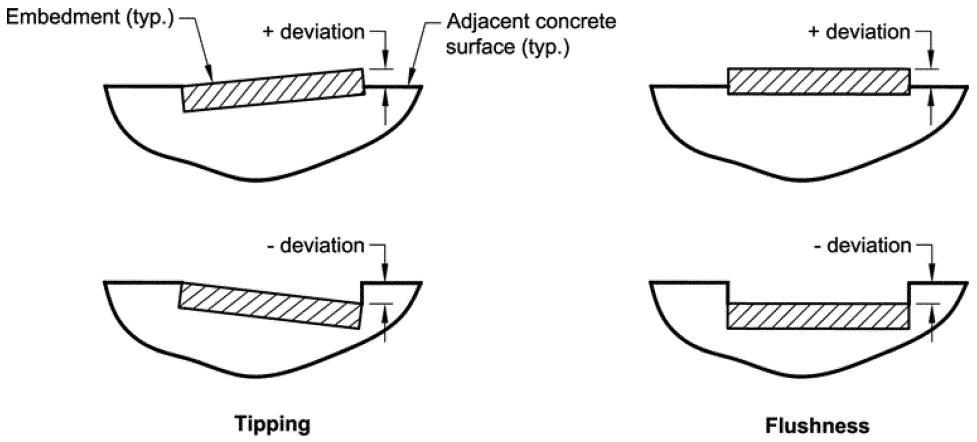

Fig. 1.3—Tipping and flushness.

embedment—item embedded in the concrete to transmit applied loads to the structure.

exposed—intended by the Contract Documents to be visible during normal occupancy.

flushness—deviation of the embedment surface from the surrounding adjacent concrete surface, as shown in Fig. 1.3.

insert—an embedment that uses a threaded device or strap anchor to connect the member to the surrounding structure or other work.

length over support—length of precast member over the support measured in the direction of the span, as shown in Fig. 1.1.

Licensed Design Professional—an individual who is licensed to practice structural design as defined by the