

CHAPTER 16—CONNECTIONS BETWEEN MEMBERS

CODE COMMENTARY

16.1—Scope

16.1.1 This chapter shall apply to the design of joints and connections at the intersection of concrete members and for load transfer between concrete surfaces, including (a) through (d):

- (a) Connections of precast members
- (b) Connections between foundations and either cast-in-place or precast members
- (c) Horizontal shear strength of composite concrete flexural members
- (d) Brackets and corbels

16.2—Connections of precast members

16.2.1 *General*

16.2.1.1 Transfer of forces by means of grouted joints, shear keys, bearing, anchors, mechanical connectors, steel reinforcement, reinforced topping, or a combination of these, shall be permitted.

16.2.1.2 Adequacy of connections shall be verified by analysis or test.

16.2.1.3 Connection details that rely solely on friction caused by gravity loads shall not be permitted.

16.2.1.4 Connections, and regions of members adjacent to connections, shall be designed to resist forces and accommodate deformations due to all load effects in the precast structural system.

16.2.1.5 Design of connections shall consider structural effects of restraint of volume change in accordance with 5.3.6.

16.2.1.6 Design of connections shall consider the effects of tolerances specified for fabrication and erection of precast members.

R16.2—Connections of precast members

R16.2.1 *General*

Connection details should be arranged to minimize the potential for cracking due to restrained creep, shrinkage, and temperature movements. The Precast/Prestressed Concrete Institute ([MNL 123](#)) provides information on recommended connection details for precast concrete structures.

R16.2.1.1 If two or more connection methods are used to satisfy the requirements for force transfer, their individual load-deformation characteristics should be considered to confirm that the mechanisms work together as intended.

R16.2.1.4 The structural behavior of precast members may differ substantially from that of similar members that are cast-in-place. Design of connections to minimize or transmit forces due to shrinkage, creep, temperature change, elastic deformation, differential settlement, wind, and earthquake require particular consideration in precast construction.

R16.2.1.5 Connections should be designed to either permit the displacements or resist the forces induced by lack of fit, volume changes caused by shrinkage, creep, thermal, and other environmental effects. Connections intended to resist the forces should do so without loss of strength. Restraint assumptions should be consistent in all interconnected members. There are also cases in which the intended force may be in one direction, but it may affect the strength of the connection in another. For example, shrinkage-induced longitudinal tension in a precast beam may affect the vertical shear strength on the corbel supporting it.

R16.2.1.6 Refer to [R26.9.1\(a\)](#).