

CODE

27.3.2 Strength reduction factors

27.3.2.1 If dimensions, size, and location of reinforcement, and material properties are determined in accordance with 27.3.1, it is permitted to increase ϕ from the design values elsewhere in this Code; however, ϕ shall not exceed the limits in Table 27.3.2.1.

Table 27.3.2.1—Maximum permissible strength reduction factors

Strength	Classification	Transverse reinforcement	Maximum permissible ϕ
Flexure, axial, or both	Tension controlled	All cases	1.0
	Compression controlled	Spirals ^[1]	0.9
		Other	0.8
Shear, torsion, or both			0.8
Bearing			0.8

^[1]Spirals shall satisfy 10.7.6.3, 20.2.2, and 25.7.3.

27.4—Strength evaluation by load test

27.4.1 Load tests shall be conducted either monotonically in accordance with 27.5 or cyclically in accordance with 27.6.

27.4.2 Load tests shall be conducted in a manner that provides for safety of life and the structure during the test.

27.4.3 Safety measures shall not interfere with the load test or affect the results.

27.4.4 The portion of the structure subject to the test load shall be at least 56 days old. If the owner of the structure, the contractor, the licensed design professional, and all other involved parties agree, it shall be permitted to perform the load test at an earlier age.

27.4.5 A precast member to be made composite with cast-in-place concrete shall be permitted to be tested in flexure as a precast member alone in accordance with (a) and (b):

(a) Test loads shall be applied only when calculations indicate the isolated precast member will not fail by compression or buckling.

COMMENTARY

determined by the licensed design professional responsible for the evaluation.

R27.3.2 Strength reduction factors

R27.3.2.1 The strength reduction factors are larger than those defined in Chapter 21. These increased values are justified by the use of field-obtained material properties and actual in-place dimensions.

R27.4—Strength evaluation by load test

R27.4.1 If the strength of the structure being evaluated may be limited by the strength of concrete or the expected failure of the structure is controlled by shear or development of the reinforcement, the monotonic load test procedure is recommended. The monotonic procedure is recommended because the sustained load applied during the monotonic test allows greater time for widening and propagation of cracks, creep, and slip of reinforcement compared with the cyclic procedure.

R27.4.4 Other involved parties may include building officials, concrete subcontractors, and persons with a future interest in the structure.