

2006 APPROVED N.C. CODE MASONRY  
RELATED AMENDMENTS TO THE 2003 IBC

**CHAPTER 7**  
**FIRE-RESISTANCE-RATED CONSTRUCTION**

**705.3 Materials.** Fire walls shall be constructed of masonry, concrete, or any approved non-combustible material. The fire resistance of concrete or masonry firewalls shall be calculated in accordance with Section 720 or determined by test in accordance with ASTM E-119. All other firewalls shall be tested in accordance with ASTM E-119. Firewalls tested in accordance with ASTM E-119 shall be conducted using the alternative hose stream test procedure described in Section 11.3 of ASTM E-119.

Exception: Deleted.

**CHAPTER 21**  
**MASONRY**

**2107.2.3 ACI 530/ASCE 5/TMS 402, Section 2.1.10.6.1.1, lap splices.**  
Modify Section 2.1.10.6.1.1 as follows: The minimum length of lap splices for reinforcing bars in tension or compression, lld, shall be:

$$l_d = 0.002dbf_s \quad (\text{Equation 21-2})$$

For SI:  $l_d = 0.29dbf_s$

but not less than 12 inches (305 mm). In no case shall the length of the lapped splice be less than 40 bar diameters.

where:

db = Diameter of reinforcement, inches (mm).

f<sub>s</sub> = Computed stress in reinforcement due to design loads, psi (MPa).

In regions of moment where the design tensile stresses in the reinforcement are greater than 80 percent of the allowable steel tension stress F<sub>s</sub>, the lap length of splices shall be increased not less than 50 percent of the minimum required length. Other equivalent means of stress transfer to accomplish the same 50 percent increase shall be permitted.

**2108.5 ACI 530/ASCE 5/TMS 402, Section 3.2.3.3.**

Modify Section 3.2.3.3 as follows: The required development length of reinforcement shall be determined by Eq. (3-13), but shall not be less than 12 in. (305mm) and need not be greater than 72 d<sub>b</sub>.

**2109.1.1 Limitations.**

Empirical masonry design shall not be utilized for any of the following conditions:

1. The design or construction of masonry in buildings assigned to Seismic Design Category D, E or F as specified in Section 1616, and the design of the seismic force-resisting system for buildings assigned to Seismic Design Category B or C.
2. The design or construction of masonry structures located in areas where the 3-second-gust wind speed from Figure 1609 exceeds 110 mph (177 km/hr). Tables 2109.4(a) and 2109.4(b) may be used in wind speeds up to 130 mph.
3. Buildings more than 35 feet (10 668 mm) in height which have masonry wall lateral-force-resisting systems.

In buildings that exceed one or more of the above limitations, masonry shall be designed in accordance with the engineered design provisions of Section 2107 or 2108, or the foundation wall provisions of Section 1805.5.

**TABLE 2109.4.1 INTERIOR WALL LATERAL SUPPORT REQUIREMENTS**  
*(delete "Exterior, 18" under Nonbearing walls)*

(insert Tables 2109.1(a&b) below from the 2002NC Code, renumbered as Tables 2109.4(a&b))

**TABLE 2109.1a-H/t LATERAL SUPPORT RATIOS FOR UNREINFORCED EXTERIOR  
MASONRY WALLS<sup>1,2,4,5</sup>**

Wall Construction	Other than Enclosed Buildings: Design Wind Speed, mph		
	90	100	110
Solid Mas. Units	19	17	14
Hollow concrete Mas. Units or Mas. Bonded Hollow Walls	14	12	10
Cavity walls Identical wyths	The H/t ratio shall be 0.70 of the H/t ratio for single wyth walls. The t value shall be the sum of the nominal thickness of the individual wyths.		
Cavity walls with wyths of different types or size masonry	The wall shall be designed based on ACI-530 or the H/t ratio may be 0.70 of the H/t ratio of a single wyth hollow wall. The value shall be the sum of the nominal thickness of the individual wyths.		

1. H = clear height or length between lateral supports. t = nominal wall thickness.
2. All masonry units shall be laid in Type M, S or N mortar. Where Type N mortar is used and the wall spans in the vertical direction, the ratios shall be reduced by 10%.
3. Design based on partially enclosed building.
4. These values are based on using masonry cement mortar. If nonlar-entrained portland cement/lime mortar is used, the values in the table may be increased by 1.2.
5. Larger H/t ratios may be used if the design is done in accordance with ACI-530.

**TABLE 2109.1b-H/t LATERAL SUPPORT RATIOS FOR UNREINFORCED EXTERIOR  
MASONRY WALLS<sup>1,2,4,5</sup>**

Wall Construction	Other than Enclosed Buildings: Design Wind Speed, mph		
	90	100	110
Solid Mas. Units	23	20	16
Hollow concrete Mas. Units or Mas. Bonded Hollow Walls	16	14	11
Cavity walls Identical wyths	The H/t ratio shall be 0.70 of the H/t ratio for single wyth walls. The t value shall be the sum of the nominal thickness of the individual wyths.		
Cavity walls with wyths of different types or size masonry	The wall shall be designed based on ACI-530 or the H/t ratio may be 0.70 of the H/t ratio of a single wyth hollow wall. The value shall be the sum of the nominal thickness of the individual wyths.		

1. H = clear height or length between lateral supports. t = nominal wall thickness.
2. All masonry units shall be laid in Type M, S or N mortar. Where Type N mortar is used and the wall spans in the vertical direction, the ratios shall be reduced by 10%.
3. Enclosed buildings are building in which the openings in any wall do not exceed the sum of the percentages of openings in the remaining walls and roof surfaces by 5% . Buildings in which the 5% limit is exceeded by one wall may still be considered enclosed if the percentage of openings in no other wall exceeds 20%.
4. These values are based on using masonry cement mortar. If nonlar-entrained portland cement/lime mortar is used, the values in the table may be increased by 1.2.
5. Larger H/t ratios may be used if the design is done in accordance with ACI-530.p