



DSA Structural Amendments under review are highlighted in GRAY

**Template 21-38**

**2001 CBC - Chapter 21A**  
**MASONRY**

**Section - 2114A - USE OF EXISTING MASONRY**

**Subsection(s) - 2114A.1**

1 **2114A.1 General.** Existing masonry which does not meet the re-  
2 quirements for reinforced grouted masonry shall not be used for  
3 structural purposes.

4  
5 **1. Method of Repair.** Pneumatically placed concrete (shot-  
6 crete) or concrete structural systems may be used to strengthen ex-  
7 isting masonry which does not comply with the requirements for  
8 reinforced grouted masonry. Such masonry shall be relieved of  
9 stress by the shotcrete or concrete, except that it may be assumed  
10 to carry its own weight vertically.

11  
12 **2. Pneumatically Placed Concrete (Shotcrete) or Concrete**  
13 **Method of Strengthening.**

14  
15 **2.1** Ribs or minor columns of shotcrete or concrete may be in-  
16 corporated into existing masonry to support vertical loads  
17 and lateral forces normal to the wall. The width of the  
18 chases cut into the masonry to form the ribs shall be at least  
19 1-1/2 times the depth. Concrete or shotcrete membranes be-  
20 tween the ribs may be used to resist shear in the plane of the  
21 walls due to lateral loads. The thickness of the membrane  
22 shall not be less than 1/24 of the clear distance between the  
23 ribs or minor columns, and in any case not less than that re-  
24 quired by Chapter 19A.

25  
26 **2.2** A membrane will be required where ribs or minor columns  
27 are more than 5 feet (1524 mm) apart in the clear. Where  
28 less than 5 feet (1524 mm) apart in the clear, a membrane  
29 will be required unless the ribs extend to the far tier of ma-  
30 sonry.

31  
32 **2.3** There shall be a rib or minor column within at least 2 feet  
33 (610 mm) of each vertical edge of each opening in the wall

34 where there is a membrane, but where there is no mem-  
35 brane, there shall be a rib or minor column at each vertical  
36 edge of each opening.

37  
38 2.4 If a shotcrete or concrete membrane is placed against only  
39 one side of a unit masonry wall, the shotcrete or concrete  
40 membrane shall be in contact with the far tier of the unit ma-  
41 sonry at not less than one point in any rectangle 4 feet (1219  
42 mm) wide and 3 feet (914 mm) high. The area of such con-  
43 tact shall not be less than 64 square inches (41,300 mm<sup>2</sup>).

44  
45 **EXCEPTIONS:** 1. If continuous ribs or minor columns are pro-  
46 vided not more than 5 feet (1524 mm) apart which extend through to  
47 the far tier, intermediate contact points may be omitted.

48  
49 2. Where the membrane is in contact with header courses that extend  
50 to the far surface, where such header courses are spaced not farther  
51 apart than every sixth course and the headers are spaced not more than  
52 12 inches (305 mm) apart, intermediate contact points may be omitted.

53  
54 2.5 Where such walls are in contact with reinforced concrete or  
55 shotcrete columns, beams or walls, the concrete or shot-  
56 crete portion of such walls shall either be constructed inte-  
57 grally with the abutting columns, beams or walls, or  
58 keyways shall be provided to resist design forces.

59  
60 2.6 Surfaces against which shotcrete is to be deposited shall be  
61 prepared in accordance with Section 1924A.1.  
62 Surfaces against which concrete membranes are to be  
63 placed shall be prepared as prescribed for shotcrete and, in  
64 addition, joints at the header courses in brickwork shall be  
65 raked back 1/2 inch (13 mm). The height of each pour and of  
66 each lift of forms shall not exceed nine times the thickness of  
67 the membrane.

68  
69 2.7 Ribs supported laterally by shotcrete membranes shall be  
70 reinforced with not less than two No. 5 bars. Other ribs shall  
71 be reinforced with a minimum of four No. 5 bars. Ribs shall  
72 have No. 3 ties at 9 inches (229 mm) on centers and shall  
73 have one No. 6 dowel, top and bottom, where ribs frame into  
74 the existing concrete construction. The membrane shall be  
75 reinforced with not less than No. 3 bars at 18 inches (457  
76 mm) on center each way. Dowels shall be provided to exist-  
77 ing concrete construction where shear is transferred. Dow-  
78 els shall be equivalent in area to the reinforcing, and spaced  
79 not more than 36 inches (914 mm) on center.