

STATE BUILDING CODE INTERPRETATION NO. I-15-05

December 5, 2005

The following is offered in response to your November 22, 2005 FAX to this office in which you seek an official interpretation of the provisions of Section 506.4 of the 2003 International Building Code portion of the 2005 State Building Code, which is effective in Connecticut for permits applied for on and after December 31, 2005.

Question: When determining the total allowable area for a building with mixed occupancies, how does one apply Section 506.4 of the 2003 International Building Code (IBC) portion of the 2005 State Building Code?

Answer: In recognition of the fact that the referenced section does not afford an easily usable path to determine the maximum area of a multi-story building with mixed occupancies, the ICC's 2004 Supplement to the 2003 IBC has added Section 506.4.1, a copy of which is included here (*italics notes are mine*):

506.4.1 Mixed occupancies: In buildings of mixed occupancy, the allowable area per floor (A_a) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to 302.3.1 (*nonseparated occupancies*). When the occupancies are treated according to Section 302.3.2 as separated occupancies, the maximum total floor area for a building shall be such that the sum of the ratios for each such area on all floors as calculated according to Section 302.3.2 shall not exceed 2 for two story buildings and 3 for buildings three stories or higher.

In view of the lack of clear direction provided by the base language of the 2003 IBC, it is my interpretation that the provisions of 506.4.1 as found in the 2004 IBC Supplement shall apply when determining the total allowable area for multi-story, mixed occupancy buildings. Keep in mind that for mixed occupancies, separated, the sum of the ratios on each floor must not exceed 1.00 in accordance with Section 302.3.2 of the 2003 IBC.

Note: For clarity in the application of this concept, I offer the following example for mixed occupancies, separated:

4 story building, Type IIB construction, actual area per floor = 15,000 s.f. The 1st floor contains a 5000 s.f. Group A-2 restaurant and 10,000 s.f. of Group B offices. The 2nd through 4th floors contain 15,000 s.f. of Group B offices. There is a two-hour fire

separation between the Group A-2 and Group B occupancies in accordance with Table 302.3.2. Assume no excess open perimeter and the building is not fully sprinklered, so there are no height or area increases allowed above the base values provided in Table 503. The Table 503 allowable values for Type IIB, Group A-2 are 2 stories, 9500 s.f. per floor and for Group B are 4 stories, 23,000 s.f. per floor. The sum of the ratios for the entire building would be determined according to the following simplified formula:

$$\frac{1_a}{1_A} + \frac{1_b}{1_B} + \frac{2_b}{2_B} + \frac{3_b}{3_B} + \frac{4_b}{4_B} = 3.00 \text{ or less (with no single floor exceeding 1.00)}$$

Where:

1_a = actual area of A-2 occupancy on 1st floor

1_A = allowable area per floor for A-2, Type IIB

1_b, 2_b, 3_b, & 4_b = actual area per floor of B occupancy, floors 1 through 4

1_B, 2_B, 3_B & 4_B = allowable area per floor for B, Type IIB

and the actual calculation looks like this:

$$\frac{5000}{9500} + \frac{10,000}{23,000} + \frac{15,000}{23,000} + \frac{15,000}{23,000} + \frac{15,000}{23,000} = 3.00 \text{ or less}$$

$$.53 + .43 + .65 + .65 + .65 = 2.91 \text{ (w/no single floor exceeding 1)}$$

So, we see that even though Table 503 would appear to allow a much larger building, the maximum total floor area provisions of Section 506.4 of the 2003 IBC limit the size of the building to a smaller building than a quick glance at Table 503 would seem to permit.