



BOCA National Building Code

*Excerpts from The BOCA National Building Code, 1999
For Head-of-Wall, Vertical Shafts, and Wall backing*

702.1 General: The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meaning shown herein.

Fireresistive joint system: An assemblage of specific materials or products that are designed, tested, and fire resistance rated in accordance with ASTM E119 to resist, for a prescribed period of time, the spread of fire through *joints* made in or between fire resistance rated assemblies.

709.4 Continuity: All vertical *fire separation assemblies* shall extend from the top of the fire resistance rated floor/ceiling assembly below to the underside of the floor or roof slab or deck above and shall be securely attached thereto. These walls shall be continuous through all concealed spaces such as the space above a suspended ceiling. The supporting construction shall be protected to afford the required fire resistance rating of the fire separation assembly supported. All hollow vertical spaces shall be fire blocked at every floor level as required in Section 721.0.

709.7 Joints: All materials utilized to protect *joints* in fire resistance rated assemblies shall comply with the requirements of Section 709.7.1 and 709.7.2. *Joints* made in or between fire resistance rated assemblies shall be protected by a fire resistive joint system designed and tested to resist the spread of fire for a time period not less than the required fire resistance rating of the adjacent assemblies.

709.7.1 Fire resistive joint systems: *Fire resistive joint systems* shall be tested in accordance with ASTM E119 listed in Chapter 35 under the following conditions:

1. The *joint* system shall be installed full height in wall assemblies and full length in floor and roof assemblies.
2. Floor and roof assemblies shall be tested with a minimum positive pressure differential of 0.01 inch of water column (3 Pa).
3. Wall assemblies shall be tested with a minimum positive pressure differential of 0.01 inch of water column (3 Pa) measured at the mid-height of the wall assembly.
4. Joint systems shall contain a splice. For wall assemblies, the splice shall be located above the mid-height of the wall.

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5. Joint systems shall be tested at the maximum joint width for which they are designed. Joint systems designed to accommodate movement shall be expanded to the maximum joint opening width for which they are intended to function.
6. Joint systems designed to be loadbearing shall be loaded to the maximum design load in accordance with their intended application.
7. Joint systems designed to accommodate movement shall be preconditioned by cycling between the minimum and the maximum joint opening width for which they are intended to function for the number of cycles specified in Table 709.7.

Table 709.7	
PRECONDITIONING CYCLES FOR FIRE RESISTANT JOINT SYSTEMS	
Type of Joint System	Number of Cycles
Expansion/Contraction	500
Seismic	100
Wind Sway	500

713.5 Joints: All materials utilized to protect *joints* in fire-resistance rated floor/ceiling and roof ceiling assemblies shall comply with the requirements of Section 709.7. *Joints* made in or between fire-resistance rated assemblies shall be protected by a *fire-resistive joint system* designed and tested to resist the spread of fire for a time period not less than the required fire-resistance rating of the adjacent assemblies.

Exception: Fire-resistive joint systems are not required for joints in:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure that complies with Section 710.0.
3. Floors within an atrium that complies with Section 404.0 where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within a mall that complies with Section 402.0.

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5. Floors within an open parking structure that complies with Section 406.0.
6. Mezzanine floors that comply with Section 505.0.
7. Roof decks, other than those required to have a 1-hour fire-resistance rating in accordance with Section 705.5, provided that the structural integrity of the roof construction is maintained.

SECTION 710.0 Vertical Shaft

- 710.1 General:** The provisions of this section shall apply to all vertical *shafts* where such *shafts* are required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies as required by Sections 713.3 and 713.4.
- 710.2 Construction:** The *shaft and the shaft enclosure* shall be constructed of materials permitted by Section 602.0 for the type construction for the building. *Shaft walls* which are exterior walls shall be constructed of materials approved for exterior walls in accordance with Chapter 14.
- 710.3 Fire-resistance rating:** A *shaft* shall be enclosed with *fire separation assemblies* complying with Section 709.0 having a fire-resistance rating of not less than 2 hours where a shaft connects four stories or more and 1 hour where connecting less than four stories. A *shaft enclosure* shall have a fire-resistance rating of not less than the required rating of the floor assembly penetrated but shall not be required to exceed 2 hours.
- 710.4 Top enclosure:** A *shaft* that does not extend to the underside of the roof deck of the building shall be enclosed at the top with a *fire separation assembly* having a fire-resistance rating of not less than that required for the *shaft enclosure walls*.
- 711.4 Continuity:** All *fire partitions* shall extend from the top of the floor assembly below to the underside of the floor/roof slab or deck above or to the fire-resistance rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto.

Backing Requirements for Hand Rails, Grab Bars, Shower and Tub Seats

BOCA, 1999

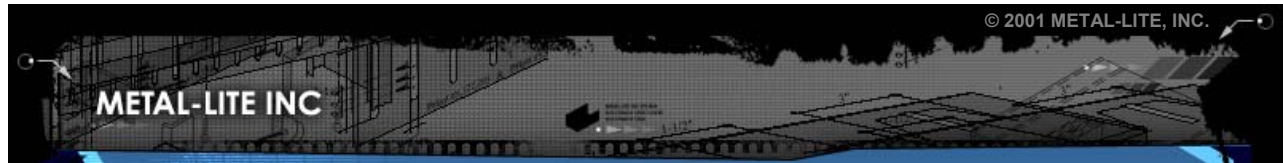
1606.4 Loads on handrails, guards, grab bars and vehicle barriers: All required handrails, guards, grab bars and vehicle barriers shall be designed and constructed to the structural loading conditions in Section 4.4 of ASCE 7 listed in Chapter 35.

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Requirements of the Americans With Disabilities Act (ADA) Code

Federal register/Vol. 56, No. 144/Friday , July 26, 1991 final rule

Section 36.401 implements the new construction requirements of ADA. The act includes a failure to design and construct facilities for first occupancy later than 30 months after the date of enactment (i.e., after January 26, 1993).

Paragraph 36.401 (A) (1) restates the general requirement for accessible new construction. *“Any public accommodation or other private entity responsible for design and construction must ensure that facilities conform to this requirement”.*

4.26 Handrails, grab bars and tub and shower seats.

4.26.3 Structural strength.

- (1) Bending stress in a grab bar or seat induced by the maximum bending moment from the application of 250 LBF shall be less than the allowable stress for the material of the grab bar or seat.
- (2) Shear stress induced in a grab bar or seat by the application of 250 LBF shall be less than the allowable shear stress for the material of the grab bar or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall be totaled for the combined shear stresses, which shall not exceed the allowable shear stress.
- (3) Shear force induced in a fastener or mounting devise from the application of 250 LBF shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.
- (4) Tensile force induced in a fastener by a direct tension force of 250 LBF plus the maximum moment from the application of 250 LBF shall be less than the allowable withdrawal load between the fastener and the supporting structure.

Wall reinforcement for the future installation of grab bars and handrails shall be installed around toilets, bathtubs, shower stalls and where grab bars are provided. The reinforcement shall be of sufficient length to meet the requirement of the grab bar and handrail installation specified herein. The reinforced wall shall be capable of supporting at least a 250 pound point load.

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