

BOCA 1996/SBC 1997 Piping Restraint Rules

The following information is based on the 1996 BOCA and 1997 SBC codes and does not take into account more stringent specifications or local requirements. Systems relating to power piping; process piping; liquid transportation systems for hydrocarbons, LPG, anhydrous ammonia and alcohol; refrigeration; slurries; or gas transmission are subject to ASME standards that should also be consulted where applicable. Should such requirements exist, they would need to be evaluated independently.

For the remainder of this document "piping" refers only to piping not related to those items above.

Prior to using this document, the appropriate peak velocity related acceleration (A_v) for the project in question must be determined.

In addition, the project must be classified by "seismic performance category". Refer to the code or separate documentation for a detailed breakdown as to the definitions of various "seismic hazard exposure groups."

Effective Peak Velocity Related Accelerations	Seismic	Hazard	Exp Grp
	I	II	III
$A_v < .05$	A	A	A
$.05 < A_v < .10$	B	B	C
$.10 < A_v < .15$	C	C	C
$.15 < A_v < .20$	C	D	D
$.20 < A_v$	D	D	E

Seismic Performance Category

Piping Exempt from Restraint Requirements

Piping of all types that does not require seismic restraint per code:

- 1) Any piping that is placed in a structure that falls into seismic performance category A or B (BOCA-1610.6 item 2 and SBC-1607.6 item 2).

Fire-Protection piping that does not require seismic restraint per code:

- 1) All piping when not "subject to earthquakes" (NFPA 13 6-4). As this definition is not clear, defer back to BOCA code 1610-2 and SBC-1607.6-2 indicating nothing required for performance category A or B (only).
- 2) Lateral bracing not required if the top of the pipe is within 6" of the support structure and the pipe is individually supported. Longitudinal bracing still is required (NFPA 13 6-4.5.3, NFPA 13 6-4.5.4).
- 3) Branch lines that are under 2.5" diameter require no bracing (NFPA 13 6-4.5.3).

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PAGE 1 OF 2

RELEASE DATE: 11/7/03



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Gas, fuel or other high hazard piping systems that do not require seismic restraint per code:

- 1) No exceptions, must all be restrained (BOCA-Table 1610.6.4(1) and SBC-Table 1607.6.4A no applicable notes)

Medical gas piping systems that do not require seismic restraint per code (assumed "other pipe systems" in BOCA-Table 1610.6.4(1) and SBC-Table 1607.6.4A as no other categories apply, however 1992 SMACNA indicates 1" max for unrestrained medical gas piping (Section 3.3)):

- 1) Runs of piping individually supported by hangers where all rod hangers are a maximum of 12" long (from top anchor position to top of pipe or from top anchor position to top of trapeze bar, whichever is longer). Adequate flexes at the equipment interfaces must be provided. Note that all hanger rods on the run must comply with the above to meet this criteria, and the swinging of the pipes must not interfere with other pipes and systems (BOCA 1610.6.4.2 and Table 1610.6.4(1) note c1 / SBC 1607.6.4.2 and Table 1607.6.4A note 3a).
- 2) Piping in mechanical rooms that is 1.0" diameter or less. The piping must also be located such that impacts with other piping or equipment will not occur during a seismic event, and adequate flexes at the equipment interfaces must be provided (BOCA Table 1610.6.4(1) note c2 and SBC Table 1607.6.4A note 3b).
- 3) Piping in other areas that is 2.0" diameter or less. The piping must also be located such that impacts with other piping or equipment will not occur during a seismic event, and adequate flexes at the equipment interfaces must be provided (Min of 1992 SMACNA (3.3) and BOCA Table 1610.6.4(1) note c3 or SBC Table 1607.6.4A note 3c).

General piping systems that do not require seismic restraint per code:

- 1) Runs of piping individually supported by hangers where all rod hangers are a maximum of 12" long (from top anchor position to top of pipe or from top anchor position to top of trapeze bar, whichever is longer). Adequate flexes at the equipment interfaces must be provided. Note that all hanger rods on the run must comply with the above to meet this criteria, and the swinging of the pipes must not interfere with other pipes and systems (BOCA 1610.6.4.2 and Table 1610.6.4(1) note c1 / SBC 1607.6.4.2 and Table 1607.6.4A note 3a).
- 2) Piping in mechanical rooms that is 1.0" diameter or less. The piping must also be located such that impacts with other piping or equipment will not occur during a seismic event, and adequate flexes at the equipment interfaces must be provided (BOCA Table 1610.6.4(1) note c2 and SBC Table 1607.6.4A note 3b).
- 3) Piping in other areas that is 2.0" diameter or less. The piping must also be located such that impacts with other piping or equipment will not occur during a seismic event, and adequate flexes at the equipment interfaces must be provided (BOCA Table 1610.6.4(1) note c3 and SBC Table 1607.6.4A note 3c).

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PAGE 2 OF 2

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