

## Tension - Only Braces Can Not Resist Vertical Seismic Load

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### *NFPA 13 Requires Rigid Bracing*

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Many manufacturers of tension-only brace product incorrectly specify the installation of a rod hanger incorporating a rod stiffener to resist upward vertical seismic force. This advice is problematic because the **NFPA 13 Standard** provides no credence for this recommendation. In the following analogy of **NFPA 13** sway brace mechanics, I have placed my comments prior to the pertinent paragraph text of the **2016 NFPA 13 Standard**.

Please remember, the **NFPA 13 Standard** is specific by using carefully crafted wording. Please reference the following:

**3.2.4 “Shall.** Indicates a mandatory requirement.”

**NFPA 13** hangers are not sway braces. No fire sprinkler hanger component is listed as a sway brace fitting. The pipe ring and the upper hanger components of the rod hanger lack the required listed sway brace load rating in tension and/or compression per **UL 203A** as specified by **NFPA 13**.

Please reference the following:

**9.3.5.2.1** “Sway brace assemblies **shall be listed** for a maximum load rating...”

**9.3.5.2.2.1** “Brace fittings and connections ... **shall be listed.**”

**9.3.5.4.3** “for all **braces** ... **allowable load shall be based** on the weakest component of the brace with safety factors.”

Hanger rings are not tight around the system pipe as required by **NFPA 13** for sway brace fittings.

Please reference the following:

**9.3.5.11.2** “Sway bracing **shall be tight.**”

**NFPA 13** requires rigid sway braces acting in compression to resist any vertical seismic load.

Please reference the following:

**9.3.5.1.1** “...**shall be braced**... to prevent vertical motion...”

**9.3.5.10** “...the **braces shall be arranged** to resist the net vertical reaction...”

As a practical **NFPA 13** solution to resist vertical seismic force, most fire sprinkler contractors install an additional pipe sway brace adjacent to the tension-only bracing. The variety of listed sway brace fittings makes it the popular choice of the fire sprinkler industry as a rigid sway brace.



Kraig Kirschner is a third generation fire sprinkler contractor and a journeyman fitter. He is a Principal Member of NFPA 13 - Hanging and Bracing Technical Committee and serves on Standard Technical Panels of UL 203, UL 203A and FM 1950. Kraig is a Life Member of the National Fire Protection Association and was named Person of the Year in 2009 Fire Protection Contractor Magazine. He holds dozens of patents that enhance the installation and application of hangers and sway braces.