

## Cable Sway Braces Can Not Restrict Vertical Movement

### *Additional Pipe Sway Braces Will be Required*

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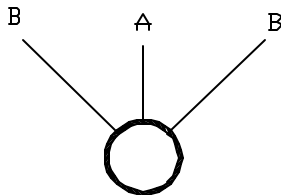
This article is written to discuss a common violation of NFPA 13. Cable sway brace manufacturers incorrectly teach the installation of a rod hanger with a rod stiffener to resist upward vertical seismic force. When resistance to this vertical force is required the NFPA 13 standard requires a sway brace be installed at this location in combination with their product. We will discuss the correct solution that contractors should use to conform to NFPA 13.

Since cable has no ability in compression two cable sway brace assemblies must always be installed opposing each other. This allows one cable assembly to always act in tension, when bracing against horizontal motion. Additionally, since these two opposing cable sway braces have no ability in compression, they then also lack the ability to resist vertical motion. They require the assistance of a rigid sway brace to resist vertical motion produced by a net vertical reaction to horizontal motion per 2002 NFPA 13- 9.3.5.7. NFPA 13 criteria are based solely upon horizontal acceleration. Though rare, as identified in the Northridge, California earthquake, vertical motion can also be caused by vertical seismic acceleration.

As a practical solution to resist vertical motion, most Fire sprinkler contractors install an additional UL listed pipe sway brace adjacent to the cable sway braces. The available variety of UL listed product for pipe makes it the convenient choice of our industry as a rigid, sway brace element.

A hanger assembly with a rod stiffener is all too often incorrectly installed at this location. Let's review the criteria such a hanger must meet noting they are almost always deficient in design and material. This hanger must meet the sway brace criteria specified by 2002 NFPA 13 – 9.3.5.10.2, which states, "All bracing fittings and connections...shall be listed". No top of hanger products such as a beam clamp or angle bracket has a listing as a sway brace component. Additionally, no bottom of hanger products like a pipe ring or clevis has a listing as a sway brace component. This confines hanger geometry to a Wraparound U-Hook of rod diameter and leg angle specified by 2002 NFPA 13 – 9.3.5.8.9. Actually, the information applies to a single rod as opposed to the two legs of a Wraparound U-Hook, which is required to avoid attachment fittings and their related listings. The fastener for this hanger component would still have to be specified per sway brace fasteners in 2002 NFPA 13 – 9.3.5.9.1. As most know, there is an allowance in 2002 NFPA 13 – 9.3.5.3.7 for hangers with rods no more than 6 inches long to exclude the required use of lateral sway braces, only. These hangers are not sway braces and cannot be applied to other sway brace functions.

In closing, the most popular installation strategy to assist cable sway braces exposed to vertical motion is to install an adjacent pipe sway brace per drawing.



A= Pipe Sway Brace at 0°

B= Cable Sway Braces at 30° - 90°

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