

Lateral and Longitudinal Sway Bracing

When One Brace Serves Both Functions

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Lateral and longitudinal sway bracing, through spaced differently and having different zones of influence, can physically be the same brace assembly. Through the years, we have discussed this topic with many contractors across the country. We enjoy researching and developing sway brace installation techniques and hope this article is useful to those who read it.

We know that NFPA allows this multi-purpose function which is clarified in the following two NFPA sections:

1999 NFPA 13-section 6-4.5.3 states “Lateral brace shall be allowed to act as longitudinal braces if they are within 24 in. (610mm) of the centerline of the piping braced longitudinally for lines that are 2 1/2 in. (76mm) and greater in diameter”

1999 NFPA 13- section 6.4.5.4 states “Longitudinal brace shall be permitted to serve as lateral braces where they are installed with 24 in. (609mm) of the piping that is braced laterally”.

Please remember that lateral bracing has its brace pipe axis oriented 90° to the pipe being braced, while longitudinal bracing has its brace pipe axis orientated parallel to the pipe being braced. When brace location opportunities present themselves, due to sprinkler pipe changes of direction, the lateral as longitudinal or longitudinal as lateral can be realized by different spacing strategies.

Contractors usually agree that lateral as longitudinal is the common situation so we will discuss the possibilities from this point of view. The attached drawings show the four most common arrangements of lateral acting as longitudinal bracing, which are:

- A.) Corner of loop or grid.
- B.) Cross main or bulk offset.
- C.) 2 1/2 min. line starter piece – side outlet.
- D.) Four-way sway brace at top of riser.

There is no explicit guidance in NFPA 13 for determining the load applied to these multi-purpose braces. The Appendix of NFPA 13, paragraph A-6.5.6, tells us on a four-way brace to add the longitudinal and lateral loads within the zone of influence for the brace. Since the braces we are discussing simultaneously address both longitudinal and lateral loads, they are functioning the same as a four-way brace. As such, the load should be calculated the same way. This produces a conservative answer and a consistent methodology that also avoids having to calculate the resultant force produced by two

forces (the lateral and longitudinal) applied 90° apart. Realistically, the difference between the two approaches has very little impact on the size of the braces, so easier is better.

The reasons for finding and identifying these possibilities are economic. Savings result from:

- 1) Less total longitudinal sway braces by count and total sway brace count overall.
- 2) Less material cost – many times the lateral brace is of smaller pipe size than the longitudinal.
- 3) Less labor due to fewer units to install, engineer or fabricate.

AFCON sway braces have uniform UL load ratings for all sprinkler pipe sizes. This is a mandatory feature for use with this strategy. If your brand lacks uniform load ratings we advise you not to attempt this strategy.

We are sure that this article covers the most common scenarios but definitely not all situations. Your attention to these opportunities during engineering will reward your efforts and add to the bottom line.

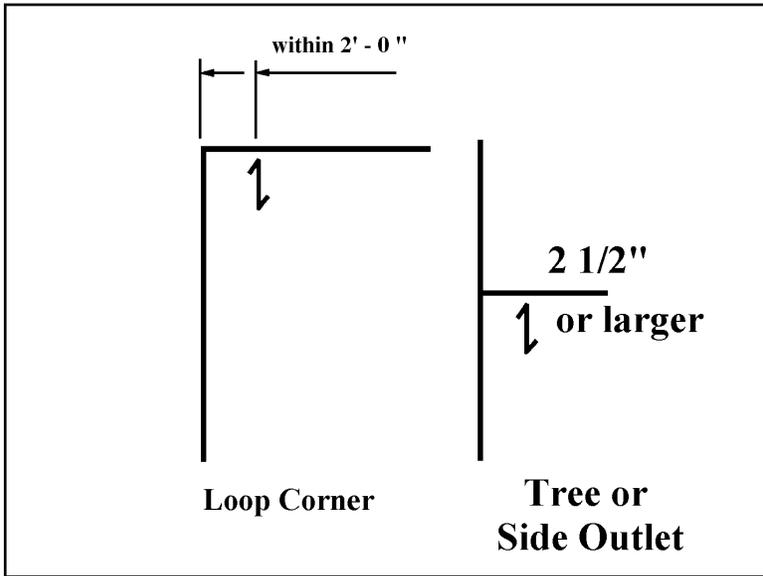


Figure A. Corner of loop or grid.

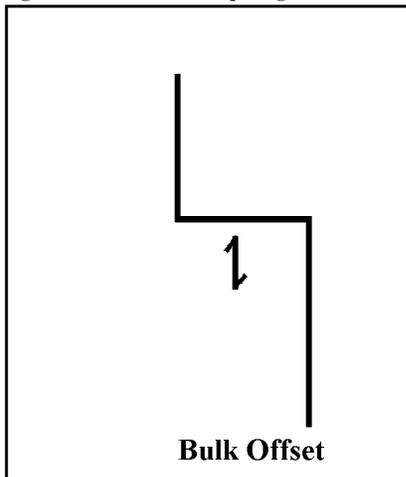


Figure B. Cross-main or bulk offset.

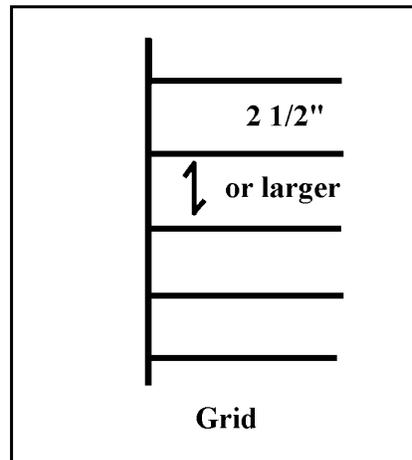


Figure C. 2 1/2 min. line starter piece-side outlet.

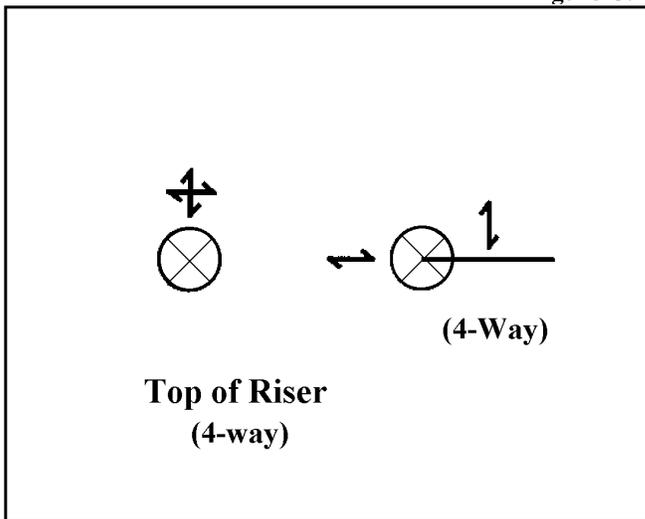


Figure D. Four-way sway brace at top of riser.