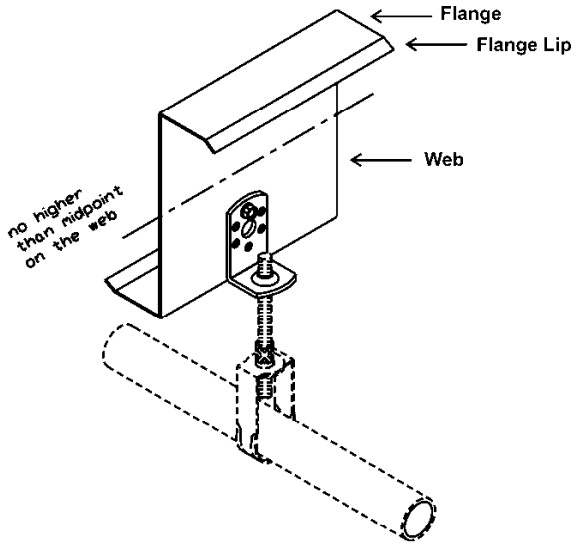
NFPA 13 Hanger Installation on Today's Z-Purlins

The steel building manufacturing industry is optimizing the design of structural building components using less material. Saving customers money on installed component cost is paramount in a competitive market environment. The need for a heavy section modulus can be overcome using specialized component configurations. In an effort to reduce mass and reduce product weight per unit, which lowers material cost, engineering the building structural components has become the norm in the construction industry. This engineering has resulted in thin metal purlins that are maintaining their primary load carrying capacity, but have reduced structural ability in any direction other than their intended orientation. Their mass has been refined toward achieving ability along a specific axis while all other non-essential abilities and related mass has been diminished. Thus, the flange has a minimal load carrying capacity.

NFPA 13 specifies that building elements supporting fire sprinkler system piping must have minimum defined capacity. NFPA 13 section 9.2.1.3.1 specifies this support capacity as 1(wt)+250# at the point of hanger attachment. The required 250# safety factor is prudent engineering typical to the fire sprinklers importance as an emergency system.

Today's lighter Z-Purlins present limited hanger installation locations for NFPA 13 fire sprinkler systems. This article identifies fire sprinkler hanger location and placement limitations specified in most Z-Purlin manufacturers' engineering literature. The drawing will be used to discuss common sprinkler pipe hanger locations and the product associated with them.



Angle bracket on web

- Web always has more capacity than flange
- Most purlins only have 1(wt)+250# capacity at this location
- Manufacturers' specified point of attachment location is the back of web
- Manufacturers' specified point of attachment is never higher than midpoint, so as not to subject purlin to rotation
- Installation is less expensive and stronger than flange attachments
- Retainer strap never required for earthquake protection

Purlin clamp on flange

- Flange is never capable of 1(wt)+250# unless specified otherwise by manufacturer
- Flange lip can not be deformed
- Maximum 1" hanger rod centerline from web
- Retainer strap required for earthquake protection

In closing, there is a reason Z-Purlin engineering data promotes the ability of the web. Most manufacturers' engineering data specifies that their Z-Purlin flanges are not capable of supporting fire sprinkler piping. These support criteria may not be a problem for other piping systems. However, fire sprinkler contractors should be very aware of these support limitations typical to today's Z-Purlins.