

Tips From Engineering

April 2021

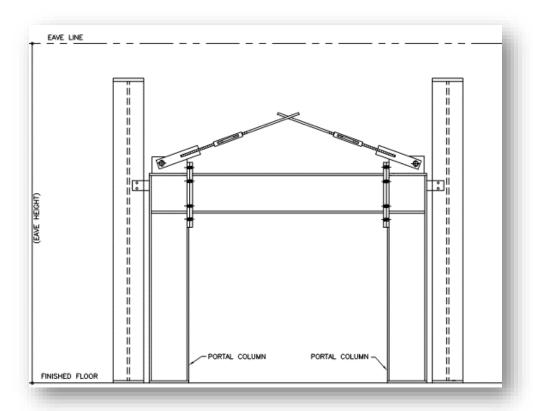
Partial Height Portal Frames Explained

Partial Height Portals vs. Full Height Portals

When you have portal frames on a project, have you ever been asked if a partial height portal frame can be used?

Partial height portal frames occur when the portal frame is ran up to a given height to clear any openings or interior processes.

Above the portal frame, switch to x-bracing from that elevation on up to the eave.



This is a good idea for several reasons.

First, X-bracing provides the least deflection in which to brace a building. So, from a performance standpoint it is the preferred method of bracing.



Tips From Engineering

Second, X-bracing is a very economical way to brace a building considering that rods are between 5/8" to 1-1/4" diameter.

Third, portal frames are far less economical than X-bracing and are inherently flexible in nature. Portal Frames can be designed to be very stiff by adding more and more steel, thus more expensive. As a portal frame gets taller, it gets more and more expensive to reduce the deflection.

Therefore, a good solution when you need portal frames is to run the portal frame only high enough to give you the clear height that you need and then run x-bracing up to the eave.



Building Geometry: 100'W x 150'L x 25'EH; 12:12 Gable; 25' Bay Bracings

Loading: 115 mph; C Wind Exposure; Wind-controlled design

Clearance: 12'0" Clear Under Portal Frame to avoid conflict with 9' tall Roll-up

Door

Portal Frame Weight:

X-brace Weight:

Full Height Portal Frames

4,400 lbs.

360 lbs.

Partial Height Portal Frames

2,260 lbs. 531 lbs.

Hopefully, this cost saving solution will be one that you can implement on one of your upcoming projects to help you be the successful bidder.