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What to consider for Longitudinal Bracing Systems

There are several factors to consider when selecting the proper longitudinal bracing system for your building sidewalls. The obvious factors include achieving the lowest cost from CBC Steel Buildings, and building and meeting architectural requirements. But the desired building performance, long-term maintenance costs, and impacts to the design/cost of other building materials should not be overlooked when choosing the bracing system. The following are descriptions of the bracing systems and considerations for their usage.

Full Height X-Bracing

The most economical of the bracing systems. Full height x-bracing is also the least flexible of all the bracing systems thereby reducing the amount of movement your building will experience. Rod, cable, and hot-rolled angles are the materials that may be used for x-bracing. Please be aware that opening locations (windows, doors, etc.) can often be adjusted such that x-bracing can be used in the same bay without interfering with the openings. CBC recommends the use of x-bracing whenever possible.

Portal Frames

Portal frames are rigid frames that span in the longitudinal direction between the primary rigid frames. Portals are a good option where a desired clear height or clear width must be met in a sidewall bay, but should generally be limited to a 30’ height. This solution is not only a more costly system than x-bracing, but also more flexible.

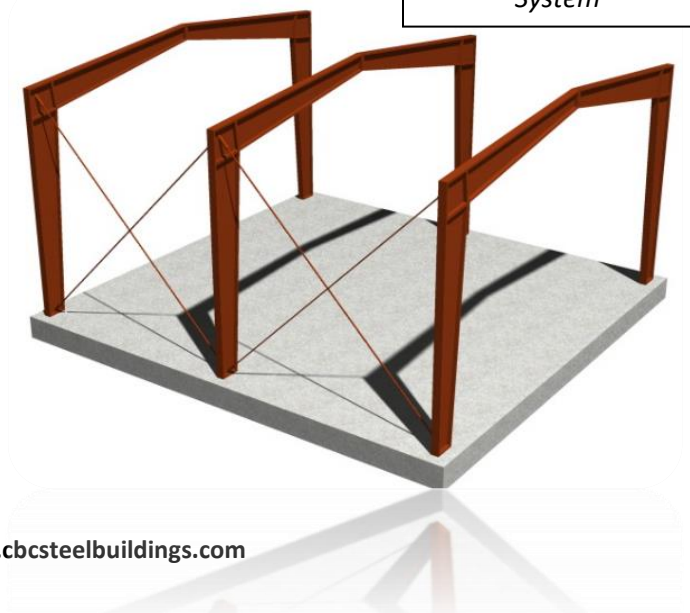
Fixed-Base Columns

Cantilevered columns resist longitudinal forces by delivering an overturning moment to the foundations, which generally results in a much larger foundation being required. The use of this system also requires our engineers to design for seismic forces approximately 2.5 times greater than the forces for x-bracing or portal frame systems. Fixed-base columns are the most flexible of all the systems, and are generally only cost effective for buildings of limited height and width.

Torsional Bracing Systems

A system where one sidewall is braced by one of the options above, but no brace is used in the opposite sidewall. Racking forces are resisted by the primary rigid frames. This system is generally very flexible and has strict limitations on building height, width, and roof slope. The use of this system with brittle material like brick, glass, EIFS, or concrete/masonry is not recommended on the unbraced sidewall.

Torsional Bracing System



Recommendations for special bracing system conditions:

• Full-height x-bracing is strongly recommended at all crane runway locations, including interior column lines. The flexibility of other bracing systems coupled with the dynamic loads of crane systems can result in continued maintenance issues for the crane system.

• Portal frames can also be utilized as partial height with x-bracing above. This is a more cost-effective solution when the clearance restrictions are not required for the full height of the building.