

SEISMIC BRACING OF MECHANICAL & ELECTRICAL EQUIPMENT

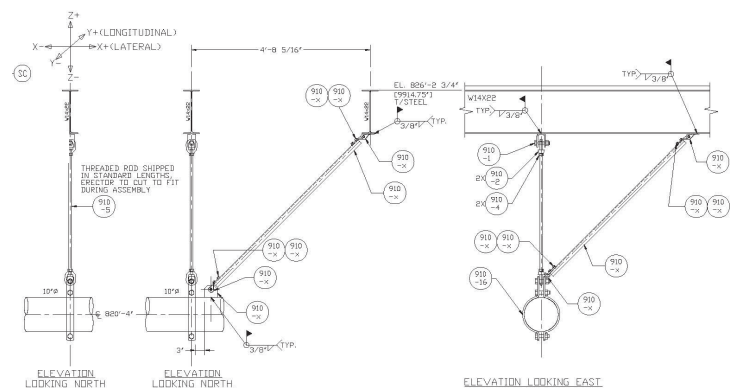
Recent natural disasters have made officials, owners and plant designers more cognizant of seismic code requirements to protect assets and insure that essentially facilities remain operational. Even in areas perceived as low risk seismic areas, seismic engineering requirements are being written into project specifications. Proper design will aide a building and it's equipment to stay structurally sound during a seismic event. Understanding when a seismic bracing system is needed and how to implement one will be beneficial to any building.

WHEN IS SEISMIC BRACING NEEDED?

Seismic bracing systems should be considered when the potential for damage to a building, it's equipment or the occupants become a loss to the owner. The purpose of the system is to ensure that the equipment is stable enough and moves with the structure. The American Society of Civil Engineers (ASCE) provides the code for when and how to implement seismic design. ASCE 7 groups buildings into seismic design catagories, provides earthquake load provisions and occupancy categories. Hospitals, fire and police stations, power plants and other essential facilities rank as the highest occupancy category and require the greatest earthquake protection.

HOW TO IMPLEMENT A BRACING SYSTEM

Each seismic bracing system is unique and is dependent on the type, weight and geometry of the equipment or systems. Ground mounted equipment such as transformers, pumps and industrial machinery are inherently heavy, requiring a robust anchoring (bracing) system to resist overturning from lateral seismic forces that can be in the range of 15% of the gravity weight. Bumpers can also be installed to help with absorbing movement.



typical piping brace

Conduit and piping systems are analyzed for each direction change. These “runs’ are then braced back to the building steel using cable or rigid steel members. Lateral loads due to conduit and piping runs typically are relatively low.

When planned and designed properly, a seismic bracing system can aide in the protection of a sturcture and it's occupants. It is best to start planning early in the design to allow for systems to be fulling integrated into a building.