

# Seismic Bracing for Cable Tray Installation in Factory Buildings

## Article Overview

Seismic bracing ensures cable trays remain secure and functional during earthquakes by using lateral and longitudinal supports, compliant with building codes and industry standards.

## Importance of Seismic Bracing

Cable trays in factory buildings are critical for power and communication distribution. During seismic events, unbraced trays can collapse, causing equipment damage, electrical outages, and safety hazards. Seismic bracing mitigates these risks by allowing trays to move with the building while maintaining structural integrity, protecting both personnel and equipment ( ).

## Types of Seismic Bracing

- o Cable Bracing: Works in tension and requires two opposing brace assemblies at each location. It is flexible and suitable for long runs or where movement is expected ( ).
- o Rigid Bracing: Works in both tension and compression, requiring only one brace per location. It is ideal for shorter drop lengths but may be limited in long spans ( ).
- o Wire Rope/Cable(TM) Bracing: Pre-stretched wire ropes act as shock absorbers, providing elastic response to seismic loads. These systems are UL listed and color-coded for easy installation ( ).

## Design Considerations

- o Tray Type: Ladder trays are preferred for primary distribution due to their strength-to-weight ratio. Perforated or trough trays may be used with careful evaluation, while wire mesh or basket trays require detailed splice and support review ( ).
- o Brace Layout: Braces must resist lateral, longitudinal, and uplift forces. Spacing, orientation, and attachment points should follow manufacturer guidance and project-specific seismic calculations ( ).
- o Differential Movement: Trays crossing seismic joints or connecting flexible and rigid zones need flexible connectors or movement allowances to prevent stress on the system ( ).
- o Cable Retention: Seismic performance includes keeping cables in place, not just supporting the tray. Retention hardware should be integrated into the seismic design ( ).
- o Anchors and Attachments: Verify that all anchors, clamps, and inserts are suitable for seismic loads and substrate conditions, including cracked concrete scenarios ( ).

## Compliance and Standards

Seismic bracing must comply with local building codes and standards such as the International Building Code (IBC), ASCE 7, and NFPA 13. In high-seismic regions, codes may mandate bracing for all cable trays ( ).

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Project-specific seismic criteria should guide tray selection, brace design, and installation.

## Practical Implementation

- o Use pre-packaged bracing kits for faster installation and verified load capacity ( ).
- o Include lateral and longitudinal braces, rod stiffeners, and proper structural attachments ( ).
- o Document and verify the system during installation to ensure compliance and performance ( ). By carefully selecting tray types, designing appropriate bracing, and following code requirements, factory buildings can maintain safe and reliable cable tray systems even during significant seismic events.

This article will explore the importance of seismic resistance in cable trays, discuss when seismic braces are

Review the proper methods for safely installing, maintaining and inspecting electrical cable trays; Provide information regarding the

Eaton's TOLCO seismic bracing solutions help protect people and non-structural components during an earthquake. For over 60

TYPICAL BRACING OF SERVICES - PLAN VIEW NOTE: COLOUR OF SYMBOL DENOTES CABLE SPECIFIED BY ENGINEER,

ASCE 7 + IBC set the U.S. seismic restraint rules for cable trays, conduits, bus duct, hangers, and anchors. IEEE 693 is

Requirement: Each straight run requires a minimum of (2) transverse braces and (1) longitudinal brace.

In Australia, seismic compliance is mandated by Section 8 of AS1170.4 (2007). EzyStrut offers a range of seismic solutions that

Overview of a cable tray seismic bracing load path from tray rail to structure. This guide serves EPC engineers, MEP

Our team of experts can help you select the best cable tray series for your application, as well as designing your seismic bracing

Cable tray runs in seismic zones need more than normal hanger spacing. A standard trapeze support carries gravity

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The ease of creating fittings, carried out on site, as well as the wide range of unique and universal accessories gives complete

Cable Trays and Cable Tray Supports This appendix provides the design criteria for seismic Category I cable trays and their

Kit contains items needed for seismic bracing long cable tray runs. Each kit contains: (4) 11" cables with mounting eyelets (2) Metal

Engineer certified designs and site inspections Ezystrut offers a range of seismic solutions that comply with Australian Standard

Using the seismic bracing system developed for this project, the bracing is attached to the building at the roof, however because of

mplementation of seismic bracing systems. This empowers our customers to check and verify the design and installation compliance

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