

Spacing requirements for two-way seismic bracing of cable trays



Overview

Design and Installation Manual for Seismic Bracing of Cable Trays Cable tray runs in seismic zones need more than normal hanger spacing. A standard trapeze.

Key Takeaways

Two-way seismic bracing of cable trays requires lateral and longitudinal supports spaced according to cable tray width, load, and seismic zone, typically ranging from 1.2 to 3 meters, with design guided by applicable building codes and standards. General Guidelines

Two-way seismic bracing involves both longitudinal and lateral bracing to prevent sway and torsion of cable trays during seismic events. The spacing of braces depends on several factors:

- Cable tray width and type: Wider trays or those carrying heavier cables require closer bracing. Typical widths range from 0.5 m to 0.9 m, with heavier loads necessitating more frequent supports .
- Seismic zone and design criteria: Areas with higher seismicity require shorter spacing between braces. For example, in U.S. seismic Zone 3, bracing spacing is reduced to ensure stability under lateral forces .



- Load considerations: The total weight of cables and trays, including future expansion, affects brace spacing. Loads can vary from 30 kg/m to 375 kg/m, and multiple layers of trays may require additional bracing .

Recommended Spacing

- Longitudinal bracing (along the tray run): Typically every 1.2 to 3 meters (4-10 feet) depending on tray width, load, and seismic design category .
- Lateral bracing (perpendicular to the tray run): Often installed at similar intervals, with additional bracing at changes in direction, intersections, or where trays are stacked in multiple layers .
- Attachment points: Braces should be connected to structural elements capable of resisting seismic forces, such as reinforced concrete walls, steel trusses, or dedicated support channels. Avoid relying solely on non-structural attachments .

Design Standards and References

- IEEE Standard 344-1987: Recommended practice for seismic qualification of Class 1E equipment .
- NEMA VE 1-1998: Metallic cable tray systems, including seismic considerations .
- Uniform Building Code (UBC) 1994: Provides nonstructural seismic bracing requirements for cable trays .
- Bellcore GR-1275-CORE: Telecommunications-specific seismic bracing criteria, often applied in high-risk installations .

Practical Considerations

- Critical systems: For hospitals, data centers, or emergency power systems, closer spacing and robust bracing are essential to prevent service disruption .
- Future expansion: Design braces to accommodate potential increases in cable load without compromising seismic performance .
- Cost vs. safety: While additional bracing increases installation cost, it significantly enhances system reliability during earthquakes . In summary, two-way seismic bracing should be designed based on tray width, load, seismic zone, and applicable codes, with typical brace spacing ranging from 1.2 to 3 meters. Proper attachment to structural elements and consideration of future loads are critical for ensuring the integrity of cable tray systems during seismic events .

Article Content

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Cable ties are provided at spacing greater than 4 feet, thereby permitting cable movement within the trays. The damping ratio used

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In the transverse direction of the cable trays the lateral forces from the middle level of cable trays were assumed to be transferred to

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design and installation of our Seismic Cable Bracing System. All of the materials and products presented have been design d and

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The AP1000 cable tray system design requires no sprayed-on material for fire protection. Cable ties are provided at spacing greater

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What are the types of cable bracing? Seismic bracing is categorized as cable bracing or rigid bracing. Both can be used in

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Seismic Design coordination of mechanical services and other plenum located elements, including lights, air conditioning, cable

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By understanding and implementing the maximum design spacing for rigid and flexible cable trays, accurately placing lateral

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Seismic Bracing Design Guide PDF

Presents seismic brace spacing charts for trapeze assemblies for piping, ducts, conduits, and cable trays using cable braces. It

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Attaching a channel cable tray by using the method illustrated in Figure 3-88 maintains the electrical requirements, and the bolted

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