Standard for cable trays with seismic bracing

Article Overview

Seismic bracing of cable trays is governed by standards such as IEEE 344, NEMA VE 1, AISC, and AISI, with design criteria based on seismic category, load combinations, and local building codes.

Applicable Standards and Codes

Cable tray seismic bracing is typically designed according to the following standards:

o IEEE 344-1987: Recommended practice for seismic qualification of Class 1E equipment, including cable trays in nuclear facilities .
o NEMA VE 1-1998: Metallic cable tray systems, providing guidance on structural design and support .
o AISC and AISI Specifications: For steel structural members and safety-related structures, ensuring the bracing can withstand seismic forces .
o Regulatory Guides (e.g., NRC RG 1.29, NUREG 1.75): Provide detailed seismic design criteria for cable tray hangers and supports in nuclear power plants .

Design Considerations

Seismic bracing design must account for:

o Dead Load (D): Weight of trays, cables, covers, and permanently attached components .
o Live Load (L): Temporary construction loads applied during installation .
o Seismic Load (Es): Forces generated during a safe shutdown earthquake, including lateral and vertical accelerations .
o Load Combinations: Bracing must be designed to resist combined effects of dead, live, and seismic loads .
o Differential Movement: Trays crossing seismic joints or connecting structures with different stiffness require flexible connectors or movement allowances .

Bracing Methods

o Lateral Bracing: Diagonal braces or HSS members transfer lateral forces from trays to structural elements .
o Vertical Rods: Maintain spacing between multiple tray levels and transfer forces longitudinally .
o Custom Brackets: Used when roof or ceiling structures cannot directly resist lateral forces, distributing loads effectively .
o Splice Reinforcement: Critical for high-seismicity projects to prevent joint separation under cyclic movement .

Standard for cable trays with seismic bracing

Practical Recommendations

o Tray Type Selection: Ladder trays are preferred for primary distribution due to high stiffness and strength; perforated or trough trays may be used with careful evaluation .
o Cable Retention: Ensure cables remain in place during seismic events, not just tray attachment .
o Seismic Certification: Verify that tray assemblies have been tested or certified for seismic performance .
o Local Code Compliance: Always follow regional building codes and project-specific seismic criteria, especially in high-risk areas . By adhering to these standards and design practices, cable tray systems can maintain structural integrity and protect critical electrical and communication systems during seismic events.

The most important lesson for seismic cable tray design is simple: do not treat seismic performance as an accessory.

A cable tray hanger is classified as a _ seismic Category I structure, and therefore, it shall be adequately designed for the effect of

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

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

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

Multi-Directional Bracing ForElectrical Conduit, Cable Tray And Mechanical Piping Systems INTRODUCTION What is Seismic

The seismic performance levels of cable tray systems are presented according to current seismic design codes. A

Seismic engineering services to help customers from pre-bid to inspection walk-through Full portfolio of seismic bracing solutions and

PERFORMANCE REQUIREMENTS Delegated Design: Engage a qualified professional engineer, as defined in Section 014000

In Antakya, a hospital using ISO-compliant cable trays retained functional emergency power and oxygen lines

despite

The cable trays have diagonal bracing between layers of cable trays in the longitudinal direction using proprietary steel members and

What criteria apply to the design of cable trays? Cable trays are designed and installed to NEMA standards such as NEMA VE-1 for

Up to 50% faster to install, the seismic bracing cable kit system is designed to suspend equipment and

When those elements are coordinated early, cable tray systems can perform far more reliably under earthquake

Learn why Cable Tray Seismic Performance Testing is essential for infrastructure safety,

The design requirements for seismic Category I structure are delineated in Regulatory Guide 1.29. This docussat provides the

Web: https://www.supremeacademicresearch.co.za