

# Basic Primer for Suspended Electrical Distribution Systems

Failures in electrical distribution systems resulting from earthquakes have historically resulted in loss of building services, are possible fire sources and carry with them the risk of occupant electrocution. While to date, the recorded instances of dollar damage to the building and its contents has been less than that of pipe or duct systems, the risk exists for serious damage and possible loss of life. In addition, failure of the building's mechanical systems can render the structure unoccupiable until the damage is corrected, and result in major problems for the tenants and/or owners.

As with the piping and duct systems, requirements for the restraint of electrical distribution systems have also become much more stringent.

Within a building structure, there are multitudes of different kinds of electrical systems, each with its own function and requirements. These include building power, communication, system monitoring, HVAC control to name a few. Requirements for the systems vary based on the criticality of the system and those systems with which it interacts. Code mandated requirements for the restraint of electrical distribution systems are addressed in Chapter D2 of this manual (Seismic Building Code Review).

**Prior to applying this section of the manual, it is assumed that the reader has reviewed Chapter D2 and has determined that there is indeed a requirement for the restraint of the system. This chapter of the manual is a "how to" guide and will deal only with the proper installation and orientation of restraints and not whether or not they are required by code or by specification.**

**This chapter also does not address the sizing of restraint hardware. Chapter D4 includes sections on sizing componentry based on the design seismic force and the weight of the system being restrained.**

Process electronics that are not directly associated with building operating systems may have their own set of requirements that should be addressed separately. High voltage electrical systems, whether building or process related should be restrained per code requirements. If there are no applicable special requirements, all systems should be restrained in a similar fashion to the building mechanical systems. This manual will not address any special requirements.

Building electrical systems must be restrained per code. Refer to the code review chapter (D2) of the manual for applicable design requirements.

In many cases, conduit can be excluded from restraint if it is small enough in size or mounted in close proximity to the ceiling structure. When applying this exemption, current codes require the installation of a "non-moment generating connection" at the top anchorage point. This term is often confusing and deserves further clarification. A "non-

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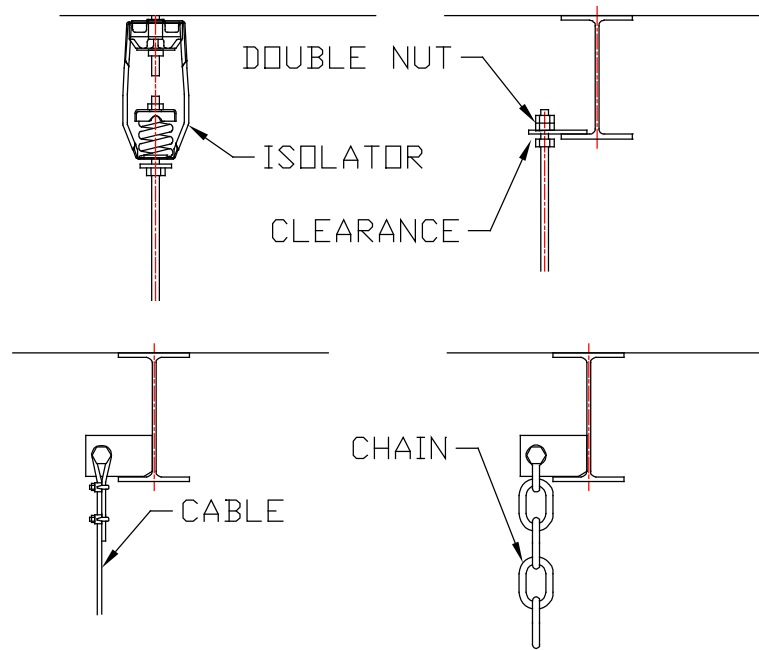
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moment generating connection” is one that will allow the supported pipe to swing freely in any direction if acted on by an outside force. Some examples of “non-moment generating connections” are illustrated below.



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