

Isolated Ceiling Seismic Restraint Design

Isolated ceilings typically weigh between 2 and 7.5 pounds per square ft and are made of 1, 2 or 3 layers of drywall. Over larger areas, the total weight of a ceiling system can become significant and the resulting seismic forces can be significant as well. In addition, it is not uncommon for ceilings to have a stepped or otherwise non-flat profile that can limit the ability to transfer these forces out to the perimeter. Even where this is not the case, significant crushing can occur along the perimeter on even moderately sized ceilings if no centralized restraint system is provided. Because of this, for ceilings either whose length or width exceeds 15 ft, internal seismic restraint elements are recommended.

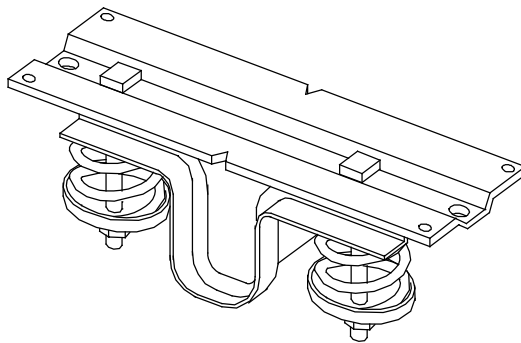
Even on smaller ceilings in some cases, equipment or light fixtures can add to the seismic loading that must be resisted and requires that appropriately sized restraints be fitted.

Restraint Types

Typically cable restraint systems are used to transfer seismic forces from the isolated ceiling to the structure in much the same way as with piping or duct systems. Because the ceilings are isolated, there is a need for cables rather than struts. An added issue when fitting restraint cables is that the cables must typically be installed and adjusted prior to the installation of the ceiling. As the ceiling adds significant weight, the springs that support it will deflect a noticeable additional amount under that weight. Care must be taken to ensure that this added deflection does not take all of the clearance out of the restraint cables and in so doing, generate a mechanical “short” for vibrations.

In some cases, seismically rated, housed ceiling isolators can be used. These are tolerant of the added deflection which occurs with the addition of the drywall. These however may not be suitable for all applications. More commonly conventional cable restraints are used with special attention given to ensure that no mechanical shorts will occur.

Seismically Rated KSCH Ceiling Support Isolator



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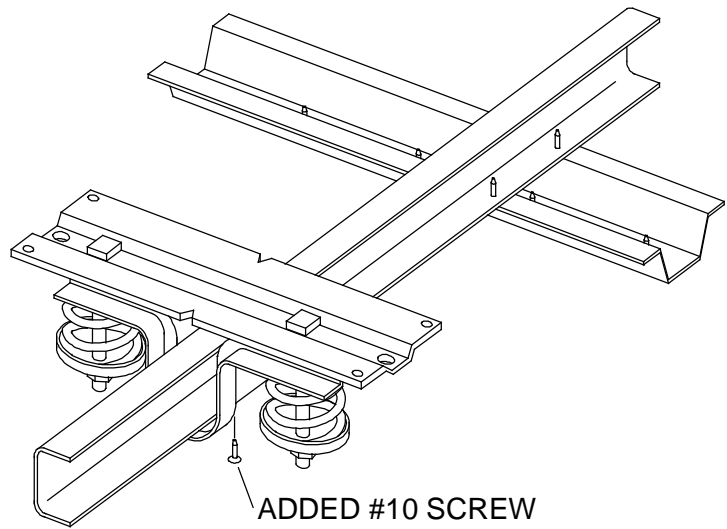
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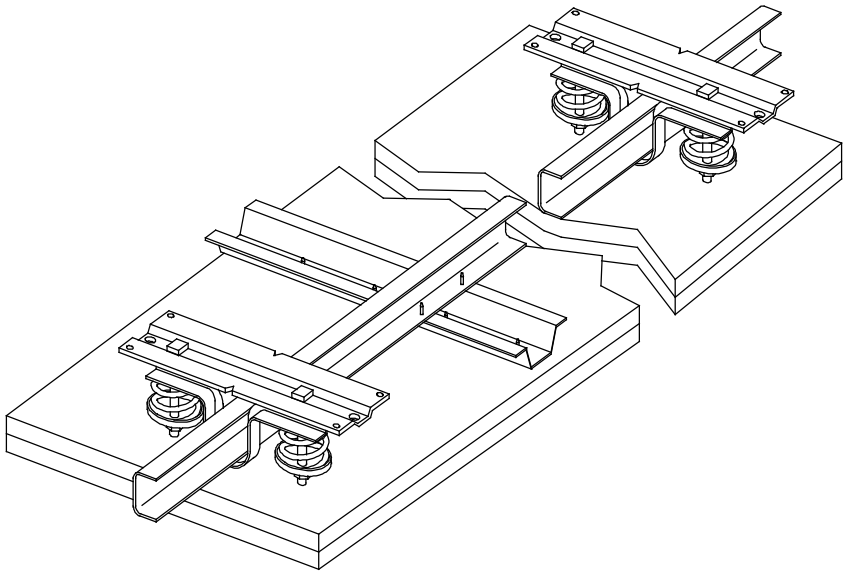
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This isolator bolts directly to wood or concrete and offers positive seismic restraint for a broad range of applications. Included is a saddle that fully contains the CR channel commonly used to support isolated drywall ceiling systems. This saddle prevents side to side motion of the channel in its basic configuration. For use in seismic applications, it must be fitted with an optional #10 screw to prevent the channel from sliding through the saddle. See also the picture below.



These Isolators are capable of supporting loads up to 140 lb per isolator while at the same time offer a horizontal restraint capacity of 100 lb each.



Typical KSCH Installation

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