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CONCENTRATED LOADS AT JOIST CHORDS

100 Pound Rule:

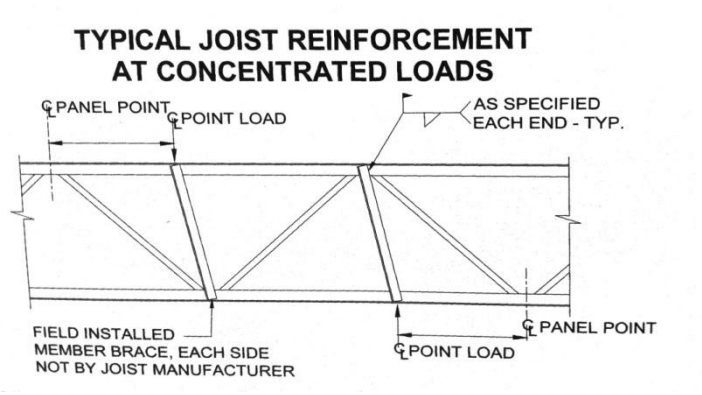
One of the most frequently asked questions Vulcraft receives from customers and erectors concerns joist reinforcement at concentrated loads and if field installed members are really necessary. Because of the myriad of questions, SJI conducted research and determined that loads up to 100 pounds placed between panel points have a negligible effect on the overall performance of the joist.

Steel Joist Institute states:

Although standard K-Series, including KCS-Series, and standard LH-Series joists are designed specifically to support uniformly distributed loads applied to the top chord, research conducted by the Steel Joist Institute, using second-order inelastic analysis, has demonstrated that the localized accumulation of uniform design loads of up to 100 pounds within any top or bottom chord panel has a negligible effect on the overall performance of the joist, provided that the load is applied to both chord angles in a manner which does not induce torsion on the chords.

For nominal concentrated loads between panel points, which have been accounted for in the specified uniform design loads, a "strut" to transfer the load to a panel point on the opposite chord shall not be required, provided the sum of the concentrated loads within a chord panel does not exceed 100 pounds and the attachments are concentric to the chord.

Concentrated loads in excess of 100 pounds or which do not meet the criteria outlined above must be applied at joist panel points or field strut members must be utilized as shown in the detail.



Vulcraft Custom Design:

When the exact location and magnitude of concentrated loads are shown on the contract drawings, Vulcraft will provide a specially designed joist with all the appropriate webs to support these concentrated loads without the need for a field applied strut.

Vulcraft has several design options available for concentrated loads that are difficult to locate during the design phase of the project. Vulcraft can design for the worst case effects of both the shear and bending moment by use of an "Add-Load". An Add-Load is a concentrated load applied at any one panel point along the length of the joist. Vulcraft can also design for a concentrated load placed between any panel points without a strut by use of a "Bend-Check" load. When a "Bend-Check" load is specified, the local bending effects (without a strut) of the concentrated load between panel points are considered in the chord design.

When either the Add-Load or Bend-Check Load are used, the contract drawing must indicate this requirement. Information which clearly explains how to do this can be found in the "**Specifying Design Loads"** section of the SJI Code of Standard Practice, Section 2.3 – Option 3.

Another option for loads that are difficult to locate is the KCS series joist. This type of joist is designed for a constant shear and an overall moment capacity. The use of KCS joists are explained in the Vulcraft catalog and SJI Code of Standard Practice Section 2.3- Option 4 indicates how to specify this type of joist.