

# LETTERS

## Was It?

The article "The Source of the Problem," by Erik L. Nelson, Ph.D., P.E., M.ASCE, Deepak Ahuja, P.E., M.ASCE, Stewart M. Verhulst, P.E., M.ASCE, and Erin Criste, M.ASCE, which was published in the January issue, presents a study of a warehouse roof collapse in the Dallas area during a severe storm in February 2001. The article explains the joist and joist bridging design and discusses the standard specifications and technical digests of the Steel Joist Institute (SJI) as they relate to this design. The authors maintain that the roof collapse was caused by the joist manufacturer's ambiguous specifications and erection plans. The SJI maintains that the authors' own research shows that the joist design and bridging layout met the design requirements specified by the project's design professional.

The authors clearly show in the tables in their article that the net uplift pressure specified by the project's design professional was incorrect. The specified net uplift pressure was 10 psf, whereas the minimum required net uplift pressure, according to the 1991 *Uniform Building Code* (in force for the project), was 17.51 psf.

The discussion of factors of safety by the authors has nothing to do with proper joist design or with properly calculating design loads or determining the number of bridging rows and erection of bridging. In fact, the authors note that the factors of safety "cannot be used as such during the design or construction." What the discussion does conclude is that the incorrectly specified net uplift pressure would result in a design that would not be within the factors of safety used to develop any

of the codes and specifications given in the article.

While the SJI publishes standard load tables for the convenience of the specifying professional, the fact is that each and every joist is specifically designed for the loads and application, including uplift, for a given project in a way that considers the anticipated bridging locations. The SJI bridging table in the specification serves as a guideline for the number of bridging rows, but ultimately the joist manufacturer will check to ensure that the bottom chord (as well as the web members) is capable of withstanding the stress reversal for the *specified* net uplift load. It is imperative that the specifying professional provide accurate information to the joist manufacturer.

The joists and bridging for the building met or exceeded the design professional's specifications and the SJI's standard specifications. The most probable cause of the roof collapse was a storm that resulted in conditions that exceeded the design requirements given in the applicable building code. Those conditions were such that neither the project's design professional nor the joist manufacturer could have foreseen them or allowed for them in the design.

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