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Construction worker fatalities related to trusses: An analysis of the OSHA fatality and catastrophic incident database

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ABSTRACT

This study was conducted to gain a better understanding of the risks associated with truss installation in building projects. The Occupational Safety and Health Administration (OSHA) fatality and catastrophic incident database was analyzed for the years inclusive of 1990–2009. The database includes over 15,000 incidents, 211 of which pertain to trusses. The incidents were analyzed as to the number of fatalities per incident, the type of truss, the truss material, the activity taking place at the time of the accident, the release of the hoisting equipment, the initiation of the accident, the presence of bracing materials, the type of construction, the length of the trusses, the location of the incident, the type of accident (fall, caught-in/between, struck by, or electrocution), and the year the fatality occurred. Many of the accidents occurred at elevation and were initiated in large part by moving or falling objects. The study recommends that further research should focus on the stabilization of incomplete roof structures and the implementation of best practices for fall protection while performing truss-related work.

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1. Introduction

The dangers involved with construction activities are well-known (Swuste et al., 2012). Some activities can be particularly dangerous, even fatal, if proper safety protocols are not followed. One such activity is the setting of trusses on buildings. Trusses are generally heavy and cumbersome. To safely perform truss installation work, special safety precautions must be exercised.

Much of the work associated with truss installation is performed at elevation. Fall protection is of course a principal concern. However, freedom of movement may also be compromised by truss spacing and configuration. Some workers are compelled to take unnecessary risks, to perform tasks in awkward positions or in unsafe locations, as in the cutting of truss tails when positioned on ladders. Building design, materials, dimensions and site conditions are often unique, which requires adaptation and a learning curve from site to site. Injuries may occur in a number of ways and at every juncture of the process.

A considerable amount of research has focused on minimizing exposure to risk on construction sites. Weinstein et al. (2005) have suggested that construction safety issues are sometimes best addressed during the design phase, and that design may have a direct

impact on job site safety. Derr et al. (2001) and Kines (2002) have attempted to elucidate the causes of falls on construction projects. A study by Kaskutas et al., 2009a based on the St. Louis Audit of Fall Risks (SAFR), showed that falls were particularly relevant in the setting of trusses, and that proper safety protocols were observed in the setting of trusses only 28% of the time. A subsequent study conducted a comprehensive needs assessment to determine gaps in the school-based apprentice carpenters' fall prevention training. The study showed that less than one third (33%) of the apprentices received school-based training in home-building tasks that involve working at heights, such as in the setting of trusses. The researchers state that it is difficult to demonstrate proper fall protection techniques without the use of a full scale model and that, "securing anchorage sites while setting roof trusses poses unique challenges". Moreover, the authors identify truss setting as a "priority area" where additional training resources should be directed (Kaskutas et al., 2009b). Truss setting is perceived to be especially risky by apprentice carpenters (Kaskutas et al., 2010; Lipscomb et al., 2008). Thirty-six apprentices were surveyed in Lipscomb et al. (2008), and perceptions of risk included work done on the top plate of a framed wall, receiving trusses from a crane, placing piggybacks, "riding the ridge", and work performed on the top plate of a wall without fall protection. It is logical to conclude that apprentice carpenters are, or may be perceived to be, at a higher risk for accidents than more experienced journeymen, in that job-specific and specialized knowledge is not acquired instantaneously or through brief training regimens. Rather, it has been

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