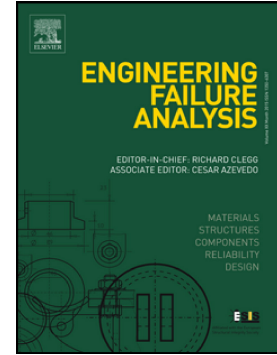


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The role of ductility in the collapse of a long-span steel roof in North Italy

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Abstract

In 2010, after an ordinary snowfall, the long-span steel trusses roof covering a school building located in a small town in North Italy collapsed. The building construction was completed in 2008, while the school was opened to the public just few months before the collapse. Luckily, at the time of the collapse, the building was empty and no people died or were injured. After the collapse, the Court nominated a first Official Technical Consultant in order to investigate on the causes of failure and related responsibilities. Later on, after that the main responsibilities were identified, a second Official Technical Consultant was nominated to further investigate on few specific technical aspects related to the collapse which were not completely clarified during the first investigations. In the present work, the main attention is paid on the structural behavior of the peculiar joint elements used to connect the members and their influence on the collapse, with emphasis on the role played by geometrical imperfections and structural ductility. The lesson learned from the case study could help professional engineers in being aware on the main peculiarities and structural deficiencies of structural systems made by spatial trusses with brittle connections.

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