LOAD BEARING CAPACITY AND LATERAL BUCKLING RESISTANCE OF STEEL TRUSSES IN INDUSTRIAL BUILDINGS

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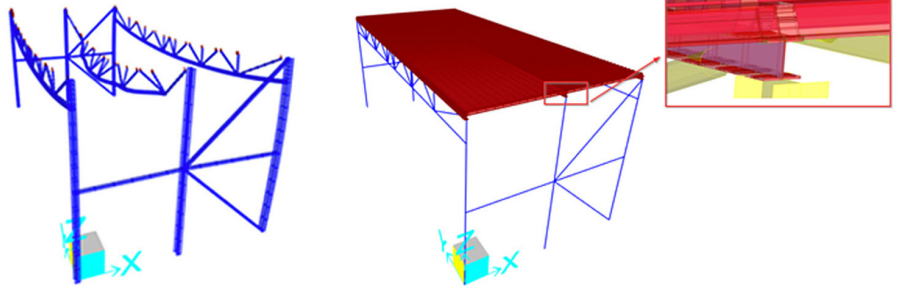*Div. of Structural Mechanics, LTH*

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BACKGROUND
Ensuring the load bearing capacity and stability of steel trusses is essential for the safe design and construction of industrial buildings. One critical aspect that requires investigation is the lateral buckling resistance of steel trusses, particularly in industrial buildings in which the steel trusses are stabilized only by trapezoidal plates (TRP) on the roof.

AIM
The work aims to investigate the load bearing capacity of steel trusses concerning their lateral buckling resistance in industrial buildings. By analysing the behaviour of these trusses under different loading conditions, this research seeks to provide valuable insights for engineers in designing and constructing robust and secure industrial structures. The aims are:

1) to evaluate the lateral buckling resistance of different steel trusses in industrial buildings with trapezoidal plates on the roof as regards the effects of:

a) trapezoidal plates on the lateral buckling behaviour

b) varying loading conditions, including dead loads, live and snow loads for symmetric and non-symmetric load.

2) to propose design recommendations for optimizing the load bearing capacity, considering lateral buckling resistance.

METHOD
Initially a literary study will be performed to gather information from similar projects, using the previous research as a foundation for the dissertation. Thereafter, a model will be created of the investigated building using ABAQUS. Numerical simulations will be performed based on the Finite element method to decide on an optimal design regarding buckling resistance of the structure

PREVIOUS RESEARCH AND NEW CONTRIBUTIONS
Another master thesis has previously been made investigating the same structure, although its objective was to examine the corrugated galvanised iron roof and its impact on the stability, see (Tosovic 2020). Our dissertation will contribute with further knowledge on the structure by analysing the steel trusses of the construction along with the effects of the trapezoidal plates. A design recommendation will be made to optimise the load bearing capacity regarding buckling resistance, which along with previous work can be used to create an ideal design.

Tosovic, N. (2020). Stability Analysis and Modelling of a Structure with Corrugated Roof. Report TVSM-5243, Div. of Structural Mechanics, Lund University.