

MASTER THESIS: Unraveling non-linear buckling behaviour of slender slipform climbing tubes

Gleitbau Salzburg is an international leader in slipform construction and heavy lifting technology for the construction of chimneys, towers, bridges, multi-floor high rise buildings, and offshore caissons/oil&gas platforms. Worldwide, Gleitbau is the only slipforming company that offers in addition to the traditional vertical slipforming, a variable section and inclined slipforming technique, successfully proven by the execution of a large number of these structures in the past.

This special slipforming application represents an essential further development regarding the challenging domain of e.g. offshore platforms – conical structures with an inclined axis. Inclinations up to 20° against the vertical alignment and variable sections from cylindrical to square (or vice-versa) without any cold joints have become a standard technique for Gleitbau Salzburg. Latest completed projects with variable sections are the Hebron Offshore Oil Platform (Exxon Mobile) and a CSP 200m Tower in Dubai (ACWA Power).

In this context, the hollow tubes upon which the slipform system is resting, are a structural element of central importance as they ensure safety on the slipform and in further steps to keep the construction tolerances within its allowable limits. Interestingly, their non-linear buckling behavior depends on the manufacturer, even under the same steel code classification.

This motivates deeper understanding of the mechanical principles leading to this peculiar behavior.

Hence, Gleitbau Salzburg and TU Wien - IMWS announce a **Master Thesis on the development of a beam theory characterized by nonlinear material behavior and moderately large cross-sectional rotations**. It shall be applied to the boundary conditions relevant for the slipform systems, in order to define the specification of material and buckling tests on the hollow tubes of different manufacturers.

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