

عنوان مقاله:

Investigation of Lateral-Torsional buckling and post-buckling analysis of thin-walled pultruded composite beams possessing initial imperfections

محل انتشار:

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خلاصه مقاله:

Applications of pultruded fiber reinforced polymer sections are increased in civil engineering due to their versatility in practices with respect to the traditional materials. The current lack of design guidance for pultruded fibre-reinforced polymer member needs more study on their structural behaviors in order to provide structural designer with confidence when applying this material into civil engineering. Elastic lateral-torsional buckling is an important global instability mode of failure in flexure for such thin walled members. The current study present a numerical study of flexural-torsional buckling and post-buckling of pultruded I sections for three point bending and cantilever beams. In the fabrication of pultrusion process, the imperfection due to lack of adequate quality control system would be inevitable and these defects should somehow be considered in estimation of load carrying capacity of such beams. Therefore, the current paper intends to incorporate the initial imperfection into the numerical finite element solution by using a non-linear feature in ABAQUS solver. The study considers the initial imperfection as geometrical defects, e.g. the minor out of straightness and longitudinal twist which were caused during the fabrication process. The results are compared with the control beam and the influences of initial imperfection on the buckling capacity and post-buckling trend will be discussed.

کلمات کلیدی:

Post-Buckling, Buckling, Pultuded Fibre Reinforced Polymer, FEA

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