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خلاصه مقاله:

In this paper, the reliability of T-stub pre-stressed connections is investigated using the numerical model. The T-stub connection is considered as a bolted one usually in the semi-rigid range. By selecting a test specimen, the T-stub bolted connection is initially simulated in the Abaqus finite element software to determine software validation and the modeling method used in this research. Then, the structural elements, loading, materials and type of analysis used in the test are introduced and 52 samples of T-stub connection controlled with construction and design constraints are determined to specify a series of targeted data through the changes in the geometric configuration and material strength of the T-stub connection elements. Finally, by performing nonlinear analyses in Abaqus finite element software and determining the limit state function of maximum tensile load of bolts in terms of random variables such as the bolt diameter, width and thickness of section flange, width and thickness of section at two performance levels, namely yielding and failure of web plate, the reliability is analyzed by Monte Carlo statistical method. The results of the probability of failure (PF) were zero for all samples under both performance levels. This is because the requirement for the failure mode not being occurred in the web of T-stub connection was observed when selecting the specimens. Therefore, the determined T-stub connection specimens are of strong bolted type and hence, the probability of failure (PF) becomes zero, which is the probability of the bolt being yielded in the unthreaded section after the web plate is yielded, and the failure of bolt in the threaded section after the failure of the web plate.

کلمات کلیدی:

Reliability, connections, pre-stressed, T-stub, Numerical Model