

Determination of Johnson-Cook Material and Failure Model Constants for High Tensile Strength Tendon Steel in Post-Tensioned Concrete Members

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Abstract : To evaluate the remaining capacity in concrete tensioned members, it is important to accurately estimate damage in precast concrete tendons. In this research Johnson-Cook model and damage parameters of high-strength steel material were calculated by static and dynamic uniaxial tensile tests. Replication of experimental results was achieved through finite element analysis for both single 8-noded three-dimensional element as well as the full-scale dob-bone shaped model and relevant model parameters are proposed. Finally, simulation results in terms of strain and deformation were verified using digital image correlation analysis.

Keywords : DIC analysis, Johnson-Cook, quasi-static, dynamic, rupture, tendon

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