World Academy of Science, Engineering and Technology
International Journal of Civil and Environmental Engineering
Vol:11, No:10, 2017

Wind Fragility for Honeycomb Roof Cladding Panels Using Screw Pull-Out Capacity

Authors : Viriyavudh Sim, Woo Young Jung

Abstract : The failure of roof cladding mostly occurs due to the failing of the connection between claddings and purlins, which is the pull-out of the screw connecting the two parts when the pull-out load, i.e. typhoon, is higher than the resistance of the connection screw. As typhoon disasters in Korea are constantly on the rise, probability risk assessment (PRA) has become a vital tool to evaluate the performance of civil structures. In this study, we attempted to determine the fragility of roof cladding with the screw connection. Experimental study was performed to evaluate the pull-out resistance of screw joints between honeycomb panels and back frames. Subsequently, by means of Monte Carlo Simulation method, probability of failure for these types of roof cladding was determined. The results that the failure of roof cladding was depends on their location on the roof, for example, the edge most panel has the highest probability of failure.

Keywords : Monte Carlo Simulation, roof cladding, screw pull-out strength, wind fragility
Conference Title : ICSDCI 2017 : International Conference on Sustainable Development of Critical Infrastructure
Conference Location : Barcelona, Spain
Conference Dates : October 30-31, 2017