

## ***Interactive comment on “Load-resistance analysis: An alternative approach to tsunami damage assessment applied to the 2011 Great East Japan tsunami” by Anawat Suppasri et al.***

### **Anonymous Referee #2**

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Review of the manuscript: nhess-2019-71 Title: Load-resistance analysis: An alternative approach to tsunami damage assessment applied to the 2011 Great East Japan tsunami Authors: Anawat Suppasri, Kwanchai Pakoksung, Ingrid Charvet, Constance Ting Chua, Noriyuki Takahashi, Teraphan Ornthammarath, Panon Latcharote, Natt Leelawat and Fumihiko Imamura.

The manuscript addresses the fragility functions of coastal buildings under tsunami demand, with application to the 2011 Japan event. The MS is well-written and benefits from high-quality presentation and figures worth to be published in NHES journal.

The authors concluded that they are proposing a novel approach allowing the assess-

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ment of tsunami damage for buildings in regions where fragility functions are not available. I agree with the utmost importance to develop alternative approaches for the tsunami damage assessment for coastal areas where there is a lack of recent tsunami damage data. However, I find that the present work overlooks the significant progress made in developing the tsunami fragility functions and doesn't take in consideration the recently published works, which makes the claimed novelty of the presented approach questionable.

The methods for deriving tsunami fragility functions can be broadly classified into four categories: (1) empirical methods based on statistical analysis of observed post-tsunami damage data (Peiris 2006; Dias et al. 2009; Suppasri et al. 2015); (2) hybrid techniques that combine damage data from remote sensing and hazard mapping (numerical simulation of tsunami inundation) (e.g., Koshimura et al. 2009a, b; Suppasri et al. 2011); (3) heuristic fragility functions based on expert opinion (e.g., FEMA 2013); and (4) analytical fragility functions based on structural modeling and response simulations (Macabuag et al. 2014; Nanayakkara and Dias 2016; Attary et al. 2017).

These classifications must appear somewhere in the MS to highlight that analytical-based approach for deriving tsunami fragility functions exists in the literature well before this submission. Therefore, the novelty of this work must be discussed in light of the above-mentioned works.

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