REVIEW OF MANUSCRIPT "LOAD-RESISTANCE ANALYSIS: AN ALTERNATIVE APPROACH TO TSUNAMI DAMAGE ASSESSMENT APPLIED TO THE 2011 GREAT EAST JAPAN TSUNAMI"

By Anawat Suppasri, Kwanchai Pakoksung, Ingrid Charvet, Constance Ting Chua, Noriyuki Takahashi, Teraphan Ornthammarath, Panon Latcharote, Natt Leelawat, and Fumihiko Imamura

This manuscript presents a new method for tsunami damage assessment for buildings in inundation area due to 2011 Great East Japan Tsunami. It is proposed as an alternative approach for the buildings located where fragility curves (previously developed by the main author and this team) do not exist. Therefore, it seems as a one-step further approach of previous studies on tsunami damage.

The manuscript has proper state of the art observational and numerical approach for tsunami modelling, damage force calculation and load-resistance analysis. The outcomes of this study would provide clear indications for tsunami hazard and risk assessment in Japan and for further studies that can be applied to other regions in the world.

The language of manuscript is so clear and very easy to understand. There is no need for proof-reading.

As a result of above, I believe that this paper would be a significant contribution for the tsunami research community.

I think the manuscript would be in its best version with minor revision and some further clarifications. I am listing my suggestions for revision and small typo correction below:

- Page 3 Line 119: "….examined in Latcherote et al (2016).
- Page 3 Line 124: "….. refers to the rotation of a building about its foundation…." Do you mean "around its foundation?"
- Page 4 Figure 1: It is better to write the definition of forces, i.e. W, R, etc in figure's caption.
- Page 5 Figure 3: Better to write (with the courtesy of ….) as a reference for the photos
- Page 5 Line 194: Is the Manning's roughness coefficients used as a spatial distribution depending on different type of buildings in study area or just constant values for a specific area? Please clarify.
- Page 5 Line 195: There is extra space between words "land" and "use"
- Page 5 Line 197: better to identify that "at the time of occurrence in 2011"
- Page 5 Line 198: better to use ";" or "and" instead of "," between sentences.
- Page 6 Figure 4: In the legend of figure, T.P. is not clear.
- Page 7 Figure 5: T.P. in the legends is not clear. Also, the color boxes in the legend were shifted. Better to reposition.
- Page 7 Figure 6: In the legend of figure, T.P. is not clear.
- Page 7 Line 228: I think it should be "through" instead of "though"
- Page 7 Line 237: Better to write a short explanation about why you used CD=1.5
- Page 7 Line 238: What is the reference for using dt=0.7sec for wooden wall? Please specify.
- Page 8 Line 272: How do you assume 3.5m,2.7m,2.1m for height of buildings in each floor? Please give reference or at least make a short explanation. Because these values are so specific.

- Page 9 Figure 7: What is the reference for these design coefficients? Also it is confusing to see A, B without having any prior explanation. We understand their meaning only after seeing Figure 8. I think better to change the order of these figures. Besides, cm/50 m2 is confusing.
- Page 10 Line 340: I think they should be **"Table 1 and 2"** instead of "Table 3 and 4"
- Page 11 Line 342: I think it should be **"Table 2"** instead of "Table 4".
- Page 12 Line 365: "…for major damage is 9.7-17.6 kN/m…."
- Page 13 Figure 10: This figure needs further explanation, especially in the caption. Are they observed or calculated values; it is not clear. Also, better to reposition color boxes in color legend (shifted).
- Page 14 Figure 13: The label "Depth/max/ depth" in color legend is confusing. Maybe better to write "critical vs max depth ratio" instead.
- Page 14 Table 4: Is there any mistake in the last column? Because in the p values footnote at the bottom there is explanation for ** and * but all values in last column are ***.
- Page 14 Figure 14: (i) I think there is a mistake in color legend and caption. Explanation of Green in legend should be "Obs. No collapse and Stat. no collapse". (ii) In figure caption it is better to write "(left)" and "(right)" instead of 1) and 2). (iii) in the caption it should be "Blue: Correct reproduction of collapsed buildings" instead of Green:…. and "Green: Correct reproduction of non-collapsed buildings" instead of Blue:… (iv) it is better to write a title on each plot, i.e. "proposed method" for the left and "fragility curves" for the right one.
- Page 16 Section 3.5: I think this section is a bit confusing in total. First of all it is not clear how you assign 25%, 50%, 75% damage ratios. Then conversion of replacement ratios in next page on Table 6 is not clear as well. Please clarify this calculation.
- Page 17 Line 517: Related with the previous suggestion, this part is not clear "to combine building damage estimations and financial losses". Further explanation is needed.
- Page 18 Line 522: Please delete "and"
- Page 18 Section 4.2: I think this proposed method needs a name. Like "fragility curves" method or else, it would be good to give a name to this new proposed method for convenience in further studies and references. Also, if applicable, I think it is better to clearly remark that this proposed method can be used for wooden buildings located along other coastal regions of Japan. It would be good to specify this method would be applicable for other regions in Japan.