Tsunami-deck: An introduction concept for a new type of tsunami evacuation shelter
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Abdul Muhari[1*], Shunichi Koshimura[1], Fumihiko Imamura[1]
MUHARI, Abdul[1*], Shunichi Koshimura[1], Fumihiko Imamura[1]

[1]DCRC, TOHOKU University
[1]DCRC, TOHOKU University

The 2011 East Japan tsunami reveals many important lessons especially for the evacuation strategy. Limited available evacuation time request more distributed temporary evacuation place. For highly populated areas in addition to the flat topographic condition, Tsunami-deck is introduced as an option for vertical evacuation place. The basic idea was taken from real experience of 2011 tsunami where people used pedestrian bridge for evacuation. It is then enhanced by extended the space above the ground to accommodate more people without occupying land in the ground. We first examined the performance of pedestrian bridge along the tsunami affected areas in Hokkaido and Honshu. In total, 68 pedestrian bridges including the ones in train stations were analyzed. We found that pedestrian bridge will collapse if flow depth is higher than its height plus 2 m. In this sense, if pedestrian bridge will use for evacuation, than the height should be higher than at least the maximum predicted flow depth plus 2 meter. We then search the possibility to expand the space of bridges deck, and placed it at intersection. The rationale of this idea is to solve the congestion problem during evacuation by putting more evacuation place along the potential evacuation route. Limitations of Tsunami-Deck application is discussed from the result of numerical experiments of tsunami flow at intersection.

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