

Interactive comment on “Experimental assessment of the relationship between rainfall intensity and sinkholes caused by damaged sewer pipes” by Tae-Young Kwak et al.

Anonymous Referee #1

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1. General comments to authors

This paper examined the effect of rainfall intensity on the sewer-related soil erosion and its evolution by means of model tests and image analysis. In order to reflect the field conditions in South Korea, the backfill material, rainfall intensity, and compaction criteria were considered in the model tests. The topic is clear and suitable with the subject of this journal. There are, however, several aspects that need to be improved, especially in relation with the test procedure and actual sewer-related soil erosion. Revising the manuscript considering the following comments are also recommended.

2. Specific comments to authors

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Q1: The terms 'ground cave-in' and 'sinkhole' are used interchangeably which are recommended to be unified.

Q2: L101 "The width of the slit was set to 2 cm, based on the study by Mukunoki et al. (2012), such that B/Dmax was 4.2." Justify the width of the slit the authors determined in relation with the listed reference.

Q3: L107-108. Some clarification on the condition of "Relationship between the rainfall intensity and the hydraulic head in the sewage network conditions near Gangnam station" are needed. I wonder if this condition has been sufficiently considered in the model tests of this study.

Q4: L117. typo (#No. 4 sieve passing).

Q5: L141-142. Additional information on the validation of PIV technique, such as accuracy, analysis condition, will be of interest to the readers.

Q6: L149. Explanation about the multiple cycles is required. I believe that one cycle consisted of water supply and drainage stage and it was repeated, but the manuscript contains only the result of one cycle.

Q7: Additional information on the rainfall record which can prove the suggested three rainfall intensities in this study are realistic will enhance the credit of this paper.

Q8: The procedure of calculating the average cavity width in Table 4 is not clear.

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