

## ***Interactive comment on “Incorporating infiltration modelling in urban flood management” by A. S. Jumadar et al.***

### **Anonymous Referee #4**

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#### General Comments:

The paper introduces infiltration into the modelling of urban flood management by using the Green-Ampt approach in an existing software package. The contribution is worthwhile communicating as this is an important topic in practice of planning and managing urban flood water. The contribution as such is of a technical nature with little or no innovation.

Infiltration modelling is well established and comparison with Richards equation is not new. In fact, the paper is not referencing any work that has been done on infiltration using Green-Ampt. I suggest that the authors should consult some text books such as

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the one by Kutilek and Nielsen (Soil Hydrology). There is an extensive discussion on exactly the infiltration formulation used in this paper.

This paper would be ideally suited as a technical note – which should be one of the options for papers in HESS. To add value that will beyond a technical note, the case studies could be used, but it would be imperative to use measured data for comparing and evaluating the new modelling option in SWMM. The most significant contribution of this paper is the result that source control option seems to be the better option for retaining the runoff response of a pristine catchment. This result would require more thorough support allowing generalization of the conclusion. This would imply a refocus of the paper (perhaps a different paper than the current one).

One additional general point is that I doubt that the information given by the paper would allow a reader to repeat the simulations with SWMM obtaining the same modelling results. I suggest that the authors either add a table with all parameters used in the modelling or add supplementary materials online to document the details.

#### Specific Comments:

Page 1536, lines 5-25: This section is poorly referenced. There should be original citations introducing both Richards equation and Green-Ampt infiltration model. Also, the citation Maidment (2007) is not in the list of references. The comment that Green-Ampt Model is physically based is somewhat misleading here. It is definitely not equivalent to Richards equation which is indicated in this section. It would be good to point out the Green-Ampt model is based on the rectangular wetting front assumption which can deviate considerably from Richards equation (see Kutilek and Nielsen).

Page 1537, lines 10-12: This comment should be introduced earlier when discussing the difference/similarity between Richards and Green-Ampt.

Page 1538.lines 5-7: Add reference here – this is not new. Line 26: The expression “fake” is a bid colloquial. Would be good to use a different expression here – may be

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“virtual”?

Page 1539: I don't think that validation is a good term for what the authors have done. They compare their model to Richards equation modelling – it is useful, but hardly a true validation for what the actual processes of infiltration in the proposed detention basins are going to be. I suggest using “comparison” instead of “validation” here.

Page 1540, lines 1-5: The information given are not sufficient to reproduce the “validation” approach. The hydraulic parameters, initial and boundary conditions used to model the infiltration using Richards equation need to be reported and it should be clearly indicated how these parameters correspond to the Green-Ampt model. Also, other scientists have looked at this – I expect that the authors to appropriately reference what has been done on this subject.

Page 1541, lines 3-5: I would be worthwhile mentioning that infiltration incorporation did not affect runoff lag time.

Figure 5: When in print this figure is not very readable.

Figure 6: Indicate what the 13 m stands for.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 1533, 2008.

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