

***Interactive comment on* “Technical note: The beneficial role of stratigraphy on slope stabilization by drainage trenches” by Gianfranco Urciuoli et al.**

Anonymous Referee #2

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The manuscript presents an interesting theoretical assessment of the effect of a highly permeable layer in a low permeable soil on drainage efficiency. I understand from the manuscript that the first part shows how t_{90} decreases with the presence of an permeable layer. The second part describes a simplified approach to calculate drainage efficiency. I recommend major revisions, mainly with regards to the second part, as detailed in the comments below.

1. Methodology and derivation of equations I appreciate the page limit on a technical note, but some of the equations are not clear. - How is the term t_{90} in equation 3 obtained from either equation 2? Is there a closed form solution or is this obtained

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through optimisation of the numerical solution? - Can you elaborate on how you got equation 4? Is this based on the interpretation of the numerical experiment or is this derived from the governing equation? Is it possible to write equation 4 as a set of differential equations? - How do you calculate pore pressures in equations 5-8? From line 145 it appears these are not based on the FEM calculation. Is there a closed-form solution?

2. Discussion of limitations of simplified approach The simplified approach is only valid if the drainage layer is fully activated. Can you add a discussion on how to determine if this condition is satisfied?

3. Discussion on real-world applicability and field testing I would recommend a section discussing how this theoretical finding could be corroborated in a field experiment (especially the concept of fully activated drainage layer)

4. Change title I suggest to make the title more specific, for instance 'The effect of a permeable layer in a low permeable soil on soil stabilisation by drainage trenches'

5. Pervious Change 'pervious' to the more commonly used word 'permeable'

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-637>, 2019.

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