

Front of unimpeded infiltrated sand moving as sediment transport through immobile coarse gravel

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© 2018, © 2018 International Association for Hydro-Environment Engineering and Research. A simple model for the front of unimpeded infiltrated sand, moving as sediment transport through immobile coarse gravel particles is proposed. The theoretical celerity of the front computed by the model matched the celerity in novel experiments made in a laboratory flume. The dimensionless infiltrated sand load through gravel, estimated from the present experiments and published data, is a function of the Shields parameter and the ratio of the sand front height minus the gravel height to the gravel diameter. No effect of the ratio of sand and gravel diameters was observed. Finally, the experimental bed resistance relationship changes from hydraulically macro-rough of the gravel particles, when the infiltrated sand front is much less than the gravel layer, to a mixture of the sand and gravel roughness, when the sand layer is on the same order of magnitude of the gravel. A new resistance law is propos