

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECTIVENESS OF INFILTRATION  
BOX IN REDUCING SURFACE RUNOFF**

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Dissertation submitted in partial fulfillment of the requirement  
for the degree of

**Master of Science**

**Faculty of Civil Engineering**

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## AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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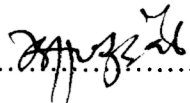
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## ABSTRACT

The laboratory scale infiltration box was introduced to temporarily store stormwater, act as medium to determine the most suitable depth of material compositions and determine the optimum of retention time. The infiltration trench is introduced as structural protection measure, reducing the surface runoff and thus to imply solving the floods problem in certain area. The main objectives of this study are to study the effect of variation depth and different material compositions to the infiltration rate, determine the water retention time for different material compositions and determine the effectiveness of infiltration box in reducing surface runoff. The objectives were achieved by constructing three infiltration boxes which conducted in laboratory scale of plot 0.4m (length) x 0.4m (width) x 0.6m (depth) container. Two types of soil used were fine sand and medium gravel separated with wire mesh. A number of data of retention time, volume contribute to saturate the material compositions and water quality parameters were analysed. World Health Organization (WHO) and Malaysia Standard were used to evaluate the water quality. The variation depth and different material compositions were generated an impact to the infiltration rate and produced different water quality. The infiltration box with combination of 0.1m depth of fine sand and 0.3m depth of medium gravel was found to be the best result in retain the water in optimum time which recorded time and saturated volume is 489s and 28.5ℓ respectively. 384 laboratory scale infiltration boxes or suggested to 11m (length) x 1m (width) x 1m (depth) size of infiltration trench provide per houses in Langat catchment area with capability to hold water for 2.2 days represent the effectiveness of the infiltration box in reducing surface runoff.

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