

礫石樁之滲流三維模擬與滲流探討

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摘要 入滲速度快慢取決於土壤特性，本研究使用礫石樁工法增加雨水入滲，作為成就海綿城市之一種手段。但地表下之情況在現地觀測及實驗皆無法以肉眼明顯的觀測入滲情形，故需透過現地及實驗室方法，配合數值模擬量估都會地區滯洪池增設礫石樁之入滲效益。研究場址位於台中市大里區工業區內的南區滯洪池，研究透過壓力鍋實驗得到現場土樣特徵參數，並進行現場入滲實驗得到飽和水力傳導係數，將實驗得到的土壤特徵參數和飽和水力傳導係數與地理數值高程運用 FEMWATER 數值模式，設定滯洪池內不同情況模擬穩態以及非穩態流況，可以令流場可視化，提供樁距之決策參考。

關鍵詞：入滲、礫石樁、數值模擬。

3-dimensional simulation and seepage processes of a gravel pile

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ABSTRACT Magnitude of infiltration depends on soil characteristics. Gravel pile is used, in this study, to enhance infiltration and so as a method to create a sponge city. Infiltration usually cannot be observed in the field. It is required by both laboratory methods and numerical simulation to quantify the infiltration efficiency of gravel piles installed in a retention pond. The study site is located in the industrial park in Taichung Dali district. The pressure plate extractor and falling head tests were used to obtain the soil water characteristic curves and the saturated hydraulic conductivity. Those soil characteristic parameters, saturated hydraulic conductivity and digital elevation model, will then employed in the FEMWATER numerical model for modeling Infiltration scenarios on steady state and transient state. The flow fields were visualized and can be used for decision making on pile distance ...etc.

Key Words: Infiltration, Gravel piles (Drainage wells), Numerical Model.

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