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Master Thesis Defense

Entitled

A FIELD STUDY ON TREATING WASTEWATER USING BIORETENTION AND PERMEABLE PAVEMENT SYSTEMS

by

Rubab Ammad

Faculty Advisor

Dr. Rezaul Chowdhury, Department of Civil and Environmental Engineering
College of Engineering

Date & Venue

10:00 AM
Thursday, 16 November 2017
Room 1004, F1 Building

Abstract

The wastewater treatment study was conducted as a part of the efforts initiated by the UAE government for combating water shortage in the country by adopting the strategy of water conservation and reuse. This study investigated the performance of two water sensitive urban design systems, the Permeable Pavement and the Bioretention System, in improving the wastewater quality from fish tanks. Conventionally, these systems are used for storm water treatment, but as UAE is situated in an arid climatic zone and experiences minimal rainfall, the two systems in undertaken study have been used in treatment of wastewater to gage their performance abilities. During the study a number of physical and chemical water quality parameters were monitored, including pH, conductivity, salinity, total nitrogen, total phosphorus, total organic carbon, chemical oxygen demand and heavy metals (lead and chromium). Field scale Bioretention and Permeable Pavement units were constructed at the Falaj Hazza campus of the UAEU. Wastewater from fish tanks was supplied to these units from the existing fish tank in the Aquaculture Research Center, located in close proximity to these units. The outcomes of the study have delineated the performance capabilities of both systems in treating the wastewater from the fish tanks and have also provided an insight into the systems' mechanics which could be addressed to enhance these capabilities of both systems.

Keywords: Water Sensitive Urban Design, wastewater treatment, Bioretention System, Permeable Pavement System