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P64

TREATMENT OF A SHOPPING MALL WASTEWATER USING AN ATTACHED GROWTH ANOXIC-AEROBIC SYSTEM

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Abstract

An integrated water quality management system involves both treatment of wastewater and appropriate reuse of the effluent. Treated wastewater from commercial establishments such as hotels, high-rise residential or office buildings and shopping malls are potential source of non-potable water for use as landscape watering and toilet flushing. This study aimed to determine the performance of a full-scale aerobic activated sludge system and a bench-scale attached growth anoxic-aerobic growth wastewater treatment system (WWTS) which operated at shorter HRT and higher organic loading rate (OLR) than the present full-scale system. The effect of HRT on the bench-scale performance was also determined. Furthermore, this study assessed the effluent water quality for possible reuse.

In the full-scale WWTS, at 2.06±0.18 days HRT and 0.396±0.123 kg COD/ OLR, the COD, BOD, FOG and TSS removal efficiency were 97.2±2.3%, 95.3±2.0%, 91.6±15.0% and 85.96±13.4%, respectively.

In the bench-scale attached growth anaerobic-aerobic WWTS, the BOD, COD, FOG and TSS removal efficiency were 97.9±2.3%, 93.6±5.9%, 87.8±22.9% and 71.4±18.5%, respectively, at 6.35 h HRT and 2.42±0.40 kg COD/ OLR. The efficiencies were better at longer HRT and lower OLR. At 12.70 h HRT and 1.50±0.30 kg COD/OLR, the BOD, COD, FOG and TSS removal efficiencies were 98.1±2.4%, 94.7±4.6%, 95.0±5.1% and 91.4±2.4%, respectively. The effluent of the bench-scale WWTS after an additional tertiary treatment could be used for landscape watering and flushing toilet.
