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DETERMINATION OF EFFECTIVENESS OF DOMESTIC SEWERAGE SYSTEM IN HIGH WATER TABLE AREA AT SATHSEVANA CHILDREN'S HOME IN MIRIGAMA SRI LANKA

S.D.G.M. Sirimanna, T.D. Denagama

*Department of Construction Technology, University of Vocational Technology, Sri Lanka
tdenagama@yahoo.com*

Abstract: The efficient operation of domestic sewerage systems is essential for public health, environmental protection, and community well-being. High water table areas present unique challenges for wastewater management, necessitating a thorough examination of existing systems to evaluate their effectiveness and resilience. This study investigates the domestic sewerage system at Sathsevana Children's Home in Thawalampitiya, Sri Lanka, an area characterized by high water tables due to its geographical and climatic conditions. Specific objectives include examining the impact of water table fluctuations on system performance, assessing structural integrity, and recommending actionable solutions. Site surveys and visual inspections were conducted to identify visible defects in the sewerage infrastructure. Water table fluctuations were monitored over four months using data from ten wells. Water quality was tested for *E. coli* contamination, and soil percolation rates were measured. The interview with the superintendent provided insights into daily wastewater output, informing system design improvements. The sewerage system at Sathsevana comprises concrete manholes, a septic tank, a brick soakage pit, and PVC pipes. High water tables during the rainy season compromise the system's efficiency, leading to potential overflow and contamination issues. Visual inspections revealed structural defects, including leakage points in the septic tank and pooling in manholes. Water quality tests indicated significant *E. coli* contamination, underscoring the need for immediate remediation. Water table analysis highlighted seasonal fluctuations, with the highest levels recorded in May. Immediate repair of septic tank leakage points and improvements in drainage and absorption capacity of the soakage pit are essential. Sustainable design modifications, including resizing the septic tank and enhancing soil percolation rates, are proposed to accommodate seasonal water table variations. Implementing these measures will ensure effective wastewater management and environmental protection in high-water table areas. The

study provides valuable insights into the challenges and solutions for managing domestic sewerage systems in high-water table regions. The findings and recommendations contribute to developing resilient and sustainable wastewater management practices, enhancing public health and environmental integrity in affected communities.

Keywords: Septic System, Soakage pit, High water table, Percolation.