

Design, Modelling, and Analysis of Floodwater Management and its Purification for Hindamata and MPT Sewri Mumbai

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Abstract: Almost all of the flooding which seriously disrupts the communication and the activity of the Mumbai city, with increasing regularity, are located within the large fill area bounded by the old islands. Not only the ground levels are low but the island of hard basalt rock form natural boundaries to the drainage areas. The low-lying topography and meteorological and hydrological conditions of the Hindamata make it vulnerable to floods and stormwater. Various measures have been conducted for the mitigation of flood and inundation damages, but the drainage problem is still one of the major tasks. The flooding inflicted serious damage over the past half century; these floods have become both more extensive and more severe as experienced in recent storms. Development in the suburbs has taken place very rapidly in recent years. The drainage system is large of open 'nalas' based on the original natural drainage channels. The system has not in all places been extended symmetrically to keep pace with development and indeed in many places development has encroached into the drainage channel thus reducing their capacity as the flows they receive have increased. To address the problem, different engineering works were utilized to provide flood protection and reduce flood damages. One alternative flood control measure is the provision of underground storage tanks for the reduction of the peak discharge of floods. Based on the hydrological, topographic, and flooding information gathered from government institutions, an underground storage tank facility with a new drain network is proposed as an alternative flood control measure in the study area to reduce the flood level and identify the volume of the proposed storage tank. The conceptual simplified model for underground storage tank simulation model has been used to simulate the operation of the tanks and to evaluate the performance of the proposed structure. Though there are many flooding spots in Mumbai, the Hindamata flooding spot is intensively affected. As the major traffic carrying road passes through this an area, it gives a serious call to look into this matter. The project deals with finding a proper solution that can be adopted for solving the flooding scenario of the Hindamata flooding spot of F/South ward, Mumbai.

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