

Development of a Flood Warning System for Smart Spongy Cities

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The Sponge City idea has been pushed as a significant work programme to address growing flood danger in metropolitan areas, as well as broader advantages for water resources and urban revitalization. Nevertheless, implementation of the notion necessitates collaboration with a diverse variety of experts as well as impacted populations. Visualization might be beneficial in this process. Flood warning systems may help to mitigate these consequences by assisting in the evacuation of individuals from likely vulnerable regions during peak flash flood periods. As a result, this study presents a conceptual approach to an automated flood warning mobile App. It was examined the issues that sponge city construction faced, as well as potential answers. The flood warning system was developed considering the frequently used permeable pavement materials such as permeable asphalt concrete, permeable cement concrete, permeable brick, and innovative pavement materials. Porous pavement materials were created to satisfy the needs of "infiltration, retention, purification, evaporation, and drainage". Pore properties, such as porosity and pore size. Flow-through the porous medium analysis was done by viewing the media as a continuum using the ABAQUS Darcy's equation model. Finally, these finite element analysis results are integrated to a mobile App which is called "Flood warning APP" for faster communication of flood status among road and city users considering the future growth of pavement materials in sponge city to improve the hydrological performances such as infiltration, runoff and absorbance.

Keywords: Flood warning system, Finite Element Analysis, Smart sponge cities, Smart App