

## **Numerical Modeling and Experimental Investigation of the Local Hydrology of a Porous Concrete Site**

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This study focuses on the development of a sophisticated mathematical model that can be used to simulate the hydrologic response of a porous concrete site following a rainfall event. The model can then be used as a tool either aiding in the site's design process prior construction or evaluating the design of an existing site.

As a base for this study a porous concrete site located in the town of Randolph, Vermont is used. Results of a field investigation include short and long term groundwater level monitoring in conjunction with rainfall data. Experiments performed in the lab aimed at quantifying evaporation rates from the coarse material beneath the porous concrete and determining water retention curves for the subgrade soil (till) are used to strengthen the knowledge of the site's physical properties and the validity of the model.

As a side part, this study aims at investigating a unique and paradoxical phenomenon that was observed on site during a controlled water release event in the summer of 2011. During the event almost 10,000 gallons of water were released on the porous concrete area. Contrary to what was expected, the water release caused a drop in groundwater head of a maximum of 3.5 ft that appeared stronger in the groundwater wells located in close proximity to the source and dissipated further away. An exact explanation of this phenomenon is yet to be determined.