

Siting, Design and Operation of Infiltration BMPs: A Case Study

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Abstract

This paper reports on experiences with infiltration basins and trenches constructed and operated as part of the Caltrans Best Management Practice (BMP) Retrofit Pilot Study Program. Fifty-two sites adjacent to highways and maintenance facilities in the Los Angeles and San Diego areas were evaluated and two infiltration basins and two infiltration trenches were constructed. One basin and one trench successfully met design expectations, which in California includes a 3-day drain time to prevent mosquito breeding. The drain time of the trench at the Carlsbad Maintenance Station in San Diego County was about twice as long as intended. The infiltration basin at I-5 at La Costa Ave., also in San Diego County, required months to drain. Based on post-construction analysis, contributing causes of these problems were inaccurate estimates of infiltration rates and groundwater depth, and application of inappropriate siting and design criteria. The short-term in-hole permeability tests resulted in higher estimates of infiltration rates than were later observed. Fluctuations in groundwater depth were larger than anticipated. Based on this experience and on computer modeling of one site, Federal Highway Administration recommendations for minimum infiltration rate and depth to groundwater can result in infiltration BMPs that do not meet performance requirements in California.