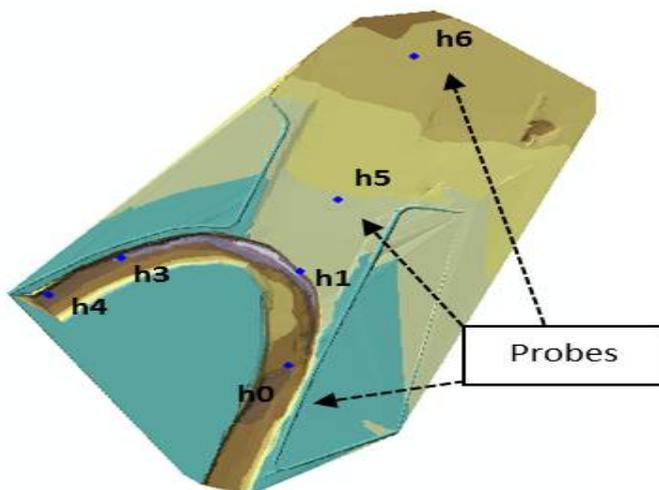


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Volume 7 (2); 25 March, 2017



Research Paper

Hydraulic Analysis of an Arrangement of Groynes on a Diversion Channel.

Hernández-Cruz A, Barajas-Fernández J, Soto-Cortés G, Rivera-Trejo F.

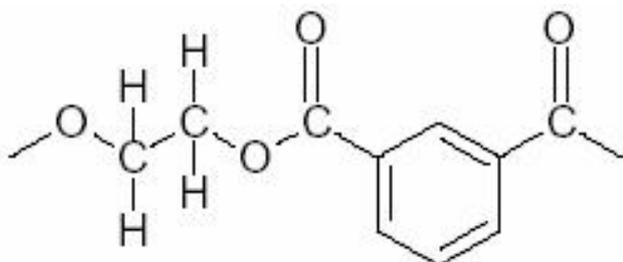
J. Civil Eng. Urban., 7(2): 25-29, 2017; pii:S225204301700004-7

Abstract

We simulated the hydraulic effect of an arrangement of seven groynes used as bank protection in a meander river with a diversion channel. We used HEC-RAS 4.1 software calibrated with experimental data obtained in a reduced physical model, 1:40 scale. Three scenarios were simulated: a) in natural conditions; b) with a diversion channel and c) with a diversion channel and protection of groynes. Also, three different types of geometries of groynes were tested: i) as a barrier, with dimensions of average height, width, and length; ii) as a set of stepped obstructions and iii) as part of natural terrain barrier. Results show HEC-RAS (1-D), reproduced adequately the effects measured in the physical model, when groynes are considered as a barrier. The groynes arrangement produced an elevation in the free surface of water, which caused a greater branching of flow in the channel. This effect was not foreseen in the original design, but, in this case, was beneficial because protects a downstream city against floods. These findings suggest although HEC-RAS is a 1D model is able to simulate satisfactorily the hydraulics effects in the groynes arrangement, also the best way to simulate the groynes in Hec-Ras, was like a barrier.

Keywords: Groyne Arrangement, Channel Protective Works, Channel Geometry, Numerical Analysis, HEC-RAS

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Research Paper

Technical-Economic Studies about Polyester Fibers with High Strength on Asphalt Mixtures with Solid Granulation.

Zahedi M, Zarei M, Azad Manesh H, Salehi Kalam A, Ghadiri M.

J. Civil Eng. Urban., 7(2): 30-35, 2017; pii:S225204301700005-7

Abstract

The term of mechanical properties of asphalt mixture by using of proper additives has been searched in recent decade by foreigner engineers. In this article, the technique of using of polyester fibers with high strength in making the asphalt samples and the Marshall test for studying the stability (technical features) of asphalt mixture used and assessed. The results indicate that in the samples in lower percent amounts of fibers, strength is increased while with increasing of the presence percent of fibers in mixture, strength is reduced. Also with increasing of fibers percent, fluidity, total void volume of mixture (VTM), void volume of aggregates (VMA) are increased ascending and on the other hand, special weight and the volume of space filled with bitumen (VFA) of mixture containing fibers with high strength were reduced by increasing of fibers presence. On the other hand, the cost of adding this kind of fibers to the asphalt mixture was estimated 10 percent of asphalt production cost that this amount of cost with regard to the positive effect of additives on asphalt seems proper. By studying and analyzing the diagrams, optimum percent of polyester fibers with high strength in this research was obtained %0.5 which has the best effect on asphalt mixture. By studying the obtained results, it was concluded that asphalt mixture strengthened with polyester fibers with high strength has been more flexible mixture than the base mixture and it can be used in the regions with moderate weather and not so much traffic.

Keywords: Polyester Fibers With High Strength, Marshall Stability, Fluidity, VTM, Special Weight

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