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Experimental characterization of micro-trenches on road pavements

Abstract:

Perugia is one of the leading cities in Italy that launched its fiber optic broadband network initiative in 2013, through the use of a new micro-trenching technology, called 1-Day-Dig (1DD) – patented by Sirti, leading Italian company in the infrastructure sector for telecommunications.

In this work we present the results of an extended experimental campaign to characterize the mechanical behavior of the materials used for the realization of the 1DD micro-trenching system. Three different types of sample have been collected from the fields and tested: i) samples from the original pavement (benchmark); ii) samples within the trenches; and, iii) samples that include the interface between the original pavement and the installed trenches. The focus of the experimental tests has been the determination of the mechanical stiffness and fatigue characteristics, at varying temperature conditions (summer and winter).

Despite several heterogeneity in the material response can be observed, due to different building conditions at the sites, overall the performance of the materials within the trenches is comparable to the performance of the ordinary pavements. On the other hand, the interfaces appears to be weaker in terms of adhesion and for this reason particular attention is paid to this issue during the 1DD realization.