

## Research of technical measures for artificial slopes stabilization and soil erosion prevention

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The embankments along the linear structures are very often not constructed the way that they would be protected against soil erosion and rills development during the construction works and operational phase. Therefore, it is becoming a routine practice to protect such slopes shortly after the construction with erosion avoiding geosynthetic materials, both natural and synthetic. Ongoing project to study the behaviour of the protected and unprotected slopes under an artificial extreme rainfall events is now running. Eight (natural and synthetics) erosion protection geosynthetics are tested for typical slopes. Methodology and results will be presented of the ongoing research project that investigates the affordable and simple technical measures that have a potential to protect the slopes against the splash erosion, rills development and the topsoil sliding.

New laboratory rainfall simulator and twins of plots (half bare soil, half with protection) in three inclinations under stable simple rainfall simulator are used for experimental. All plots are equipped with sediment and runoff collection system and with soil water regime and temperature regime monitoring network.

The measuring campaigns of 7 materials – biodegradable full surface covering coconut mattress (biomac-c), coconut grid with unit weight of 400g/m<sup>2</sup> (K400), coconut grid with unit weight of 700g/m<sup>2</sup> (K700), permanent 3D mattress from polypropylene with thickness of 9 mm (Macmat 9.1) and with thickness of 18 mm (Macmat 18.1) and permanent root reinforcement mat from nylon with thickness of 7,5 mm (Encamat 7010) and with thickness of 15,2 mm (Encamat 7020) – will be compared hereafter. It compares the surfaces with erosion protection material and with bare soil for different slope inclinations.

We compare and evaluate the runoff, soil loss and surface topography changes (sliding, soil compaction and rills development) on the protected plots and bare soil.

At the moment we can conclude that tested erosion protection materials did not have any significant influence on the surface water runoff, however they significantly, more than ten times, reduced the amount of topsoil washout, mainly due to scour development prevention. Difference between tested erosion protection materials are insignificant. The outcome from the up to date testing we could conclude that any erosion protection geosynthetic is much better than no protection whatsoever.

The research is funded by the Technological Agency of the Czech Republic (research project TH02030428) and an internal student CTU grant (SGS17/173/OHK1.)