Landlok® TRM 450
Permanently Reinforces Vegetation
in Arizona Channels

The Challenge

Trailwood West Limited Partnership, a local developer in the Town of Payson, Arizona, wanted to develop 90 acres (36.4 hectares) of forested farmland into a 313-home subdivision. An existing channel with intermittent flow levels, known as the North Tributary of American Gulch, meandered through the project site, raising a stormwater concern with the Town. This channel collected rainwater and runoff from the surrounding 3.55 square mile (9.2 square kilometer) drainage basin, carrying it through the site. Further downstream was a natural grass-lined channel, but localized erosion and great anticipated flows convinced the project engineers, ASL Sierra Consulting Engineers, Inc. (ASL), that advanced channel lining techniques must be employed.

The Solution

Because of the anticipated velocities and shear stresses, ASL's initial thoughts focused on hard armor systems such as rock riprap or a cellular confinement system filled with gravel. These systems were cost prohibitive and not as aesthetically pleasing as natural vegetation. These factors led ASL to further explore alternative, cost-effective solutions. After extensive review of technical literature and test reports, the project engineers discovered that using a permanent turf reinforcement mat (TRM) designed to induce vegetation and enhance long-term performance was the optimal solution. Therefore, the engineers incorporated Synthetic Industries Landlok TRM 450 into the project specifications. This product consists of a dense web of polypropylene fibers positioned between two high strength nets, and mechanically bound by parallel stitching. All components of the matrix are UV-stabilized to resist degradation caused by

June, 1995 Installation of Landlok TRM 450

Vegetative establishment after one year.

the intense sunlight characteristic of a semi-arid site at an elevation of 7,000 feet (2134 meters). Because TRM's are porous, as opposed to concrete lining materials, the infiltration benefits of TRM's were equally appealing to the engineers since the Town is adopting a groundwater recharge program.

Installation

Revegetation Services, an Arizona based erosion control contractor, began construction following design completion and Town approval. After subgrade preparation, the TRM was installed, seeded with a mix including: Indian blanket, California poppy, burnet clover, crested wheatgrass, Boer lovegrass, Madrid sweetclover, and green spangletop, then soil-filled to a depth of 3/4" (1.9 cm). The soil cover was specified to accelerate germination and seedling development, maximize root entanglement with the matrix, add ballast to the installation, and provide additional UV protection prior to vegetative development.

According to an area consultant, Marty Koether, of Enviro-Control (Tucson, Arizona), "The weather cooperated beautifully for the contractor. The installation ran smoothly because Revegetation Services had prior experience with the product. Upon completion, the anticipated summer rains severely tested the TRM prior to vegetation being established."

"Since the TRM was designed to handle flows associated with a maximum storm event in an unvegetated condition, the establishment was a bonus and added to the factor of safety considered in the original design," Koether stated.

Results

Nearly two years later, vegetation is flourishing in this semi-arid section of Arizona, and the channels are performing well.

The TRM was soil-filled to maximize performance.

Aesthetically pleasing channel provides permanent protection.

"The channel bed and sideslopes are excavated in highly decomposed granite soils," stated Tom Loomis, Project Manager with ASL. "We have found it difficult to stabilize this type of soil using traditional rock riprap methods without creating ongoing maintenance problems. The Landlok TRM 450 has solved that problem and also satisfied the developer's aesthetic concerns."