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STREAM BANK STABILIZATION/BIOENGINEERING PROJECT TURTLE CREEK, MURRYSVILLE, PA

Special Conditions outlined in permit agreements between the US Army Corps of Engineers (USCOE) Pittsburgh District Regulatory Branch necessitated the design and completion of a Stream Mitigation Project for stream impacts associated with commercial development along US Route 22. Following comprehensive field surveys, bioengineering based plans were developed for three separate locations within the Turtle Creek Watershed located in the Municipality of Murrysville. These included a stream bank stabilization and restoration design for two (2) areas on Turtle Creek in Duff Park and a realignment and stabilization plan for an unnamed tributary to Haymaker Run at Bear Hollow Park.

Design plans were based on the severity of bank degradation on Turtle Creek and the inherent risk associated with the adjacent areas needing protection. Stream banks necessitated the application of bioengineering practices that would provide continuous protection, were flexible relative to design, and combined easily with other techniques and existing structures (gabion baskets). In addition, stabilization methods needed to be appropriate to the stream type and channel dimensions of Turtle Creek in Duff Park. Longitudinal Peaked Stone Toe Protection (LPSTP), as originally developed by Dave Derrick at the USACE hydraulics laboratory in Vicksburg, MS, was used as the primary restoration approach on Turtle Creek. LPSTP is a cost-effective and versatile means of providing continuous bank protection. The LPSTP designs also utilize live siltation to augment structure function. The live siltation assists by slowing flows and encouraging deposition when the LPSTP is overtopped (as designed) during high flow events. Rock vanes were added as an additional measure to redirect and center stream flow away from sensitive banks. Structures were constructed of appropriate sized rock blended into self-launching mixtures.

The three (3) projects were completed with cooperation and support from the Municipality of Murrysville and the Turtle Creek Watershed Association. Stabilization of soils in-place greatly reduced off-site disposal costs. All project sites were monitored for five (5) years following construction in 2005 (bioengineered structures, macroinvertebrates, fish, vegetation) as required by USACE agreements.



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