Soft Bank Stabilization Works: A Case Study

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The Joe R. Adair Outdoor Education Center (OEC) is located in Laurens, South Carolina. Flowing through the center's property is a stream that carries large volumes of water from local rains. Development in the surrounding areas significantly increased the runoff to the creek which increased the stream flow volume. As a result of this increase, about 100 ft length of the stream bank suffered a major failure exposing a 20 foot length of natural gas pipeline. Every major storm accelerated the streambank erosion. Since the natural gas pipe line was exposed, the Laurens' Commission of Public Work (CPW) was very interested in repairing the problem area.

Figure1. Eroded site

Civil engineering consultants to the CPW came up with plans to correct the problem. Recommendations included covering the entire problem area with large stone rip-rap. The OEC staff did not favor this plan and requested a soft solution for the eroded streambank. As a result, the city agreed to get assistance from a professional civil engineer knowledgeable in soil bioengineering techniques. The original engineering plans were modified to accommodate a soft approach, and large stone rip-rap was replaced with coir fabric encapsulated in soil layers with live willow cuttings placed between layers. This soft approach specified a minimum use of rock at the toe of the bank and a coir roll positioned on top of the rock layer. The design layout was developed with rock at the toe placed below the water level in order to avoid visibility.

Figure 2. Upon completion of construction

Construction of the project was completed the last week of July 1998. The major question to be answered was, can live willow cuttings survive the hot summer? Staff at the OEC faced the challenge and watered the reconstructed bank during August and September. After two months, the whole streambank was green and willows were growing very well. There were several heavy rainfall activities occurred during the first two months after construction and the reconstructed streambank held up very well. Members of the CPW were very pleased with the outcome of the project. The OEC is using the site as an educational tool to show the effectiveness of soft bank stabilization compared to hard bank stabilization methods.

Figure 3. Two months after construction

The success of this project demonstrates that soil bioengineering technique using live plant cutting is possible during summer months as long as adequate irrigation is provided.