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Vegetated Riprap Installation Techniques for Streambank Protection, Fish and Wildlife Habitat Creation

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Vegetated riprap is a cost effective alternative to conventional riprap erosion protection. Terra Erosion Control has experimented with the vegetation of riprap over the past ten years. As a result we have adapted a technique that will successfully establish vegetation during the installation of riprap structures. This vegetation will provide additional bank protection, soften the rock appearance and enhance fish, wildlife and urban habitat along the shoreline.

Topics to be discussed:
• Introduction and benefits of vegetated riprap
• Vegetated riprap processes and installation techniques
• Early survival and growth results
• Equipment and techniques for working in watercourses and sensitive areas

Introduction and Benefits of Vegetated Riprap
Vegetated riprap incorporates a combination of rock and native vegetation in the form of live cuttings. These are planted in conjunction with the placement of rock used to armour the banks of watercourses.
Establishment of native vegetation will improve fish habitat by creating shade, cover and an input of small organic debris to the stream. In most cases it will negate the need for the regulator to require habitat alteration compensation. It will also provide added bank protection through the development of root mass. Adding vegetation to riprap provides a softer, more natural appearance to the installed rocks.

Vegetated Riprap Process and Installation Techniques
This presentation will detail the processes involved in the installation of vegetated riprap; such as the harvesting and soaking of live material, site preparation of the stream bank, placement of riprap in conjunction with live material, use of burlap fabric and soil amendments. It will also discuss the innovative method of using wooden boards to protect live cuttings during construction and to direct precipitation and / or irrigation water to the root zone during the establishment phase of the vegetation. These boards will eventually biodegrade within the rock. This approach was applied to the stream banks of eight different sites on large and medium sized rivers in three Provinces of Canada.

Early Survival and Growth Results on Structures Installed Since 2006
To date the survival and growth of vegetated riprap brush layers installed along riverbanks has been assessed as good to excellent, resulting in the substantial creation of fish, wildlife and urban habitat. The survival and growth results will be presented from the various sites.

Equipment and Techniques for Working in Watercourses and Sensitive Areas
Working adjacent or within watercourses requires specialized techniques and equipment to reduce environmental impact. Floating turbidly curtains can be used to contain sediment while working within water bodies. Equipment such as walking excavators and tracked dump trucks equipped with biodegradable hydraulic fluid can be used in riparian areas of difficult access to minimize disturbances.

Biography
Mr. Pierre Raymond is a senior site rehabilitation specialist. He has worked since 1990 in the natural resources sector in British Columbia and Alberta, Canada. Since 1996, his focus has been on soil bioengineering, biotechnical slope stabilization, erosion control and riparian habitat restoration.

In 2002 he was involved in the monitoring, auditing, training and trial establishment of erosion control measures on a pipeline project in southern Peru. In 2010 he was involved in the assessment and development of soil erosion remedial measures on the access road of the Upper Tamakoshi Hydro Electric Project in Nepal.

Pierre's experience includes biotechnical stabilization prescriptions, implementation, maintenance and monitoring. He has a strong background in post-harvest silviculture treatment, supervision of construction machinery and road deactivation practices. Recent involvement includes the development of streambank restoration guidelines for the City of Calgary, Alberta Canada and implementation of riparian habitat restoration, vegetated log crib walls, storm water outfall protection and mining reclamation.