

Bank Protection/Erosion Repair Design Guide

INTRODUCTION AND PURPOSE OF DESIGN GUIDE

This Design Guide is intended to clarify the Chapter 1 of the Water Resources Protection Manual, section VIII, articles D-H (Outfalls, Pump stations and Site Drainage). This Design Guide describes how to address streambank erosion problems, and how to use bioengineered methods of bank protection and erosion repair.

This Design Guide is to be used by local permitting agencies, property owners and professionals who design projects on streamside parcels (i.e. civil engineers, land use planners, landscape architects, etc..) It is intended to:

- Provide guidance for how to design a variety of bank protection projects, in places where streambanks are, have, or may be eroding
- Promote proactive approach to preventing and resolving serious erosion problems

This document is a guide, not an instruction manual. Erosion repair activities within a stream channel will impact water quality, flood protection, the stability of adjacent properties, and the habitats of many stream-dependant species. It is for these reasons that these activities require several state and federal permits, as well as the involvement of qualified professionals to help design and construct the project in a way that addresses stability and long-term water resource protection. Examples of more detailed guidance manuals are listed at the end of this document for reference.

Moving Toward Soft, More Systemic Methods of Bank Protection/Erosion Repair

Traditional methods of controlling erosion have relied on “hard” structural practices such as covering banks with interlocking concrete blocks and building retaining walls. However, these techniques often have negative impacts on streams. In many cases, these methods are also expensive and ineffective in the long run. Recommended instead are “soft” or bioengineered bank stabilization methods. A bioengineered approach involves the planting of native streamside or riparian vegetation combined with the strategic placement of logs or minimal rock, where necessary, and regrading of steep slopes wherever possible in order to produce living systems that minimize erosion, control sediment, and provide habitat. The natural attributes of plants, when combined with stabilized bank slopes, provide better dynamic stream systems than stationary hard structures.

An objective of this Design Guide is to protect, and where appropriate, restore streambanks and related stream resources. Where suitable, it encourages a systemic approach to streambank protection and stream restoration. This Design Guide starts by describing how streams function, typical features of a stream and importance of riparian vegetation. It then discusses typical causes of streambank erosion and recommends basic measures to be considered when planning and designing a bank protection erosion repair project. Finally, alternative methods of protecting a streambank are presented, starting with how to treat a reach of a stream in a more rural setting where there is room to use a more systemic approach, and continuing with a variety of treatments for smaller, urban parcels, which include a small reach of a stream.

Goals/Purpose of Streambank Protection Activities

In general, the goals of any bank protection/erosion repair activity should be to:

- Maintain or increase stream stability and facilitate transport of sediment and water;
- Avoid localized solutions that repair only a single erosion site but reduce the stability of neighboring stream banks and cause erosion problems on upstream or downstream properties;
- Enhance and increase native vegetation both in extent and diversity to provide habitat value and help ensure long-term bank stability.

With these goals in mind, this Design Guide delineates some general guidelines and issues to consider when embarking on a bank-protection/erosion-repair project, as well as a description of various erosion-repair techniques. This guidance also provides agency staff and streamside property owners with a brief overview of how streams are formed, their common characteristics and features, and typical causes of streambank erosion.

ORGANIZATION OF THIS DESIGN GUIDE

This Design Guide is organized into two parts and six subsections. The Technical Primer part includes useful background information that explains the causes of erosion. Homeowners and project developers will likely refer to the Techniques and Guidance part more frequently, because it outlines techniques and guidelines for erosion repair.

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