Streambank and Shoreline Protection (feet)

Definition

Using vegetation or structures to stabilize and protect banks of streams, lakes, estuaries, or excavated channels against scour and erosion.

Scope

This standard applies to measures used to stabilize and protect the banks of streams, lakes, estuaries, and excavated channels. It does not apply to erosion problems on main ocean fronts and similar areas of complexity not normally within the scope of SCS authority or expertise. All revetments, bulkheads, or groins are to be no higher than 3 ft. above mean high tide or, in non-tidal areas, not higher than 3 ft. above mean high water.

Purpose

To stabilize or protect banks of streams, lakes, estuaries, or excavated channels for one or more of the following purposes:

1. To prevent the loss of land or damage to utilities, roads, buildings, or other facilities adjacent to the banks,

2. To maintain the capacity of the channel,

3. To control channel meander that would adversely affect downstream facilities,

4. To reduce sediment loads causing downstream damages and pollution, or

5. To improve the stream for recreation or as a habitat for fish and wildlife.

Conditions where practice applies

This practice applies to natural or excavated channels where the streambanks are susceptible to erosion from the action of water, ice, or debris or to damage from livestock or vehicular traffic. It also applies to controlling erosion on shorelines where the problem can be solved with relatively simple structural measures, vegetation, or upland erosion control practices and where failure of structural measures will not create a hazard to life or result in serious damage to property.

Planning considerations

Water Quantity

1. Effects on the water budget, especially on volumes and rates of runoff, infiltration, deep percolation, and ground water recharge.

2. Effects on downstream flows and aquifers that affect other uses and users.

3. Effects on the water table of adjoining fields.

4. Effects on the interflow discharge into streams.

Water Quality

1. Filtering effects of vegetation on movement of sediment, and sediment-attached and dissolved substances.

2. Effects on erosion and movement of sediment, and soluble and sediment-attached substances carried by runoff and streamflow.

3. Effects on the visual quality of on-site and downstream water resources.

4. Effects of construction and vegetation establishment on quality.

5. Effects of changes in water temperatures.

6. Short-term and long-term effects on wetlands and water-related wildlife habitats.

Design criteria

Because each reach of a channel, lake, or estuary is unique, measures for streambank and shore protection must be installed according to a plan and adapted to the specific site.

Designs for streambanks shall be according to the following principles:

1. Protective measures to be applied shall be compatible with improvements planned or being carried out by others.

2. The grade must be controlled, either by natural or artificial means, before any permanent type of bank protection can be considered feasible, unless the protection can be safely and economically constructed to a depth well below the anticipated lowest depth of bottom scour.

3. Streambank protection shall be started at a stabilized or controlled point and ended at a stabilized or controlled point on the stream.

4. Needed channel clearing to remove stumps, fallen trees, debris, and bars that force the streamflow into the streambank shall be an initial element of the work.

5. Changes in channel alignment shall be made only after an evaluation of the effect on the land use, interdependent water disposal systems, hydraulic characteristics, and existing structures.

6. Structural measures must be effective for the design flow and be able to withstand greater floods without serious damage. They shall also be designed to avoid an increase in erosion downstream of planned measures.

7. Vegetative protection shall be considered on the upper parts of eroding banks, especially on areas that are susceptible to infrequent inundation.

Streambank protection measures. The following is a partial list of elements that may be included in a plan for streambank protection.

- Removal of fallen trees, stumps, debris, minor ledge outcroppings, and sand and gravel bars that may cause local current turbulence and deflection.

- Removal of trees and brush that adversely affect the growth of desirable bank vegetation.

- Reduction of the slope of streambanks to provide a suitable condition for vegetative protection or for the installation of structural bank protection.

- Placed or dumped heavy stone, properly underlaid with a filter blanket, if necessary, to provide armor protection for streambanks.

- Deflectors constructed of posts, piling, fencing, rock, brush, or the materials that project into the stream to protect banks at curves and reaches subjected to impingement by high velocity currents.

- Pervious or impervious structures built on or parallel to the stream to prevent scouring streamflow velocities adjacent to the streambank.

- Artificial obstructions, such as fences, to protect vegetation needed for streambank protection or to protect critical areas from damage from stock trails or vehicular traffic.

Designs for shoreline protection shall be according to the following principles:

1. Treatment depends on soil type and the slope characteristics both above and below the waterline. Slope characteristics below the waterline shall be representative of the slope for a minimum of 50 ft. (15 m) distance from the shore.

2. End sections shall be adequately bonded to existing measures or terminate in stable areas.

3. Design water surface shall be mean high tide or in non-tidal areas the mean high water.

4. Control of surface runoff and internal drainage shall be considered in the design and installation of all shore protection measures.

Shoreline protection measures. The following is a partial list of protection measures that may be used:

- Bulkheads (timber, concrete, concrete block).

- Revetments (prefabricated slope protection blocks, riprap, soil cement).

- Groin systems (timber or concrete).

- Vegetation of the type that will grow across or along the waterline.

Fish and wildlife. Special attention shall be given to maintaining or improving habitat for fish and wildlife.

Landscape resources. Considerations shall be given to the use of construction materials, grading practices, vegetation, and other site development elements that minimize visual impacts and maintain or complement existing landscape uses such as pedestrian paths, climate controls, buffers, etc.

Plans and specifications

Plans and specifications for streambank and shoreline protection shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

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STREAMBANK PROTECTION SPECIFICATIONS

Measures and construction methods that enhance fish and wildlife values shall be incorporated as needed and practical. Special attention shall be given to protecting and maintaining key shade, food, den trees, and visual resources and to stabilizing disturbed areas.

Removal of any trees and brush shall be done in such a manner as to avoid damage to other trees and property.

Disposal of trees, brush, and other materials shall be done in such a way as to have the least detrimental effect on the environment.

Construction operations shall be carried out in such a manner that erosion and air and water pollution are minimized and held within legal limits.

The completed job shall present a workmanlike finish.